News of the Industry Begins Page 422

AUTOMOTIVE INDUSTRIES

Volume 57
Number 12

PUBLISHED WEEKLY AT CHESTNUT AND 56TH STREETS
PHILADELPHIA, SEPTEMBER 17, 1927

35c a copy
$3.00 a year

Entered as second-class matter Oct. 1, 1925, at the post office at Philadelphia, Pa., under the Act of March 3, 1879

At Your Command!

Specialized Facilities for the Development of *Unified Design*~

The successful development of *unified* design in motor car appearance calls for facilities of a highly specialized nature—not always available.

At Ternstedt such facilities are at your command.

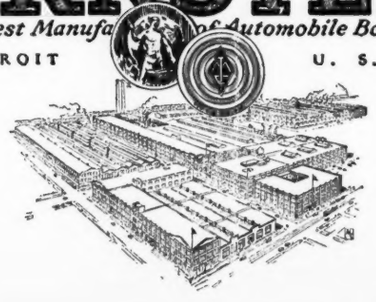
Artists. Artist-Engineers. Designers. Modelers. Die-Chasers. A complete staff is prepared to carry out in every detail the modern demand for artistic harmony of design in all body hardware fittings and similar appointments.

Wherever these experts have been permitted to "sit in" on new designs notable results have been achieved.

TERNSTEDT

World's Largest Manufa[illegible] of Automobile Body Hardware

DETROIT U. S. A.



AUTOMOTIVE INDUSTRIES
VOLUME 57 *Philadelphia, Saturday, September 17, 1927* NUMBER 12

Factory Buying Practices—
Tendency is to "Play Fair" With Parts Makers

Some instances of rather sharp dealing have been brought to light recently, but many car manufacturers are inclining toward more consideration for suppliers.

By J. C. Gourlie

THE stern spotlight which has been directed of late upon buying practices in the automotive industry has brought to view a few instances of distinctly unfair forms of contract and a rather prevalent disposition to modify purchase orders on inconveniently short notice. But it has also made plain the indubitably important fact that most automobile factories are desirous of playing fair with their sources of supply and that a firm position taken by the supplier will usually be recognized by the buyer as good, legitimate business.

An automobile manufacturer cannot be blamed for making his purchases on a basis more favorable to him than to the source of supply, if the seller is willing to let him do it, and if the manufacturer does not eventually subject himself to difficulties in the way of interrupted production. But if the suppliers hold out for a fair price and a reasonable schedule of delivery orders, the manufacturer will more often than not see the justice of the demand. Numerous instances of this character have developed recently.

The long run failure of weak selling policies was strikingly brought out not long ago by one very large manufacturer of motor cars. He had been buying an item of original equipment for several years at prices fixed by competitive bidding among several suppliers. The time came for renewal of the contract and the manufacturer made an investigation of the cost of making the item.

This investigation revealed that the part could be made much cheaper than the price currently being paid by the factory. The suppliers were invited to meet this price on any part of the total requirements of the factory. They protested their inability and the motor car manufacturer decided to make the part himself.

Now the reason why the parts makers could not meet the price of the motor car manufacturer was that their tool equipment was antiquated. They could not buy the needed new machinery because their prices for years had been so low that no reserve for replacements could be accumulated. Plainly they might better have gone out of business than continue on what was actually a losing basis.

But can the manufacturer be blamed for accepting the low price when it really was not unusually low on the basis of the equipment then the best for turning out the job? Certainly not. He is going to get the lowest price obtainable so long as he does not run the risk of sudden interruption of supply.

Bad ethics and bad business can, however, be charged to the car manufacturer if he:

1. Asks for prices on a much larger quantity than he has need for with the ob-

IT is important for the parts maker to stand up for his rights at the inception of business dealings with the car manufacturer," says Mr. Gourlie in this article. "The purchasing agent these days wields tremendous power, and in addition he is always under pressure from his company to bring down costs and secure whatever other concessions may be feasible.

"If a courageous position is not taken at the outset of a sale the buyer may feel that he holds the whip hand and may be in the mood to expect further allowances.

"On the whole, it appears accurate to say that there has been of late a tendency to eliminate the more unfair of the buying practices within the industry."

ject of getting lower prices than he would be entitled to otherwise.

2. Takes the plans of an improved part or device developed by one maker to another who can give a lower price because he has no experimental or research cost to absorb.

3. Through over-rigid inspection rejects parts ordered, but which he finds he does not need at the time.

4. Fails to give sufficient notice of releases to the parts maker, which may lead to interrupted production or to the imposition on the parts maker of the difference between freight and express shipping charges.

Borderline Cases

Other close buying practices to which exception is sometimes taken are borderline cases and need to be considered individually. Hand-to-mouth buying is undoubtedly with us to stay and the whole question is just how far it can be pursued without its disadvantages wiping out its advantages. The answer depends on so many factors that an iron-clad system of buying just cannot be worked out. A contract that attempts to cover every contingency not only takes the flexibility out of business but leads to argument and bad feelings over technicalities and thus to mutual distrust. Good faith is the foundation of most successful businesses and the automobile industry has at least its share of men and companies in whom implicit confidence may be placed.

There is a vast difference in the time taken to turn out various parts of an automobile, which is one obvious reason why the order or notice of release need not be given so far ahead in some instances as in others. Then, too, materials bought for the fabrication of one part may be used in another if an order is cancelled. Sometimes this is not possible and then the parts maker might be entitled to reimbursement.

Again, on contracts where development work or new tooling is involved, the parts maker may be clearly entitled to a minimum number of sales. The safer way is to quote an initial price for the development work or tooling and many manufacturers will be willing to pay this.

Some parts makers have been able to incorporate provisions in their contracts that deferment or cancellation instructions can be given after material is in process of manufacture only if the purchaser will pay for the material and labor used as well as the estimated overhead and profit. But even when this is in the contract it is doubtless not always enforced.

There seems no sound and equitable manner in which holdups and cancellations can be totally avoided. The parts maker is only one of a chain that begins with the producer of raw materials and ends with the car or truck buyer. If an unexpectedly large number of prospective purchasers decide next month not to buy motor vehicles some company or several are bound to suffer.

So long as such situations recur it is illogical for the parts maker to expect to be relieved of his share of the loss, as would be the case if orders were given a considerable time ahead of the factory's requirement and if all such orders were carried through to the letter and deliveries accepted by the factory. What normally happens when sales slump unexpectedly is that the car factory finds stocks piling up in dealers' hands. A drastic

In days gone by the parts makers have frequently received some rather rough treatment at the hands of the vehicle builders, due to close buying practices on the part of the latter. Of late, however, there has been a trend toward more just buying methods and the parts maker who deals firmly with the factories finds that the going is considerably smoother

cut in production schedules is then ordered and cancellation or holdup orders sent to parts and material suppliers. Despite these measures the inventories of the car factory inevitably rise and loss is caused by the disruption to production. If the slump is of serious proportions the dealers, the car manufacturer and the parts companies all suffer more or less in proportionate degree.

Justice is Recognized

The justice of this spreading of the consequences of unsatisfactory sales is of course rather generally recognized. The car manufacturer can use only as many parts as will go into the number of cars he is able to sell and while this usually can be calculated with reasonable accuracy there are certain to be unforeseen developments at times.

After all, what most soundly managed companies in the industry are attempting to do is to take the gambling out of business. There are many ways of doing this and they nearly all involve the question of purchasing practices. At best there remains a certain residuum of gambling inherent in any large enterprise and there is a tendency to go to unfair lengths to eliminate chance completely. This can only be done by shifting the burden entirely to the supplier and it is here that the parts company can best serve its own interests by taking a firm stand.

A definite, non-cancellable order for a certain number of parts over a period of months or a year would be gambling by the buyer but it would be completely safe for the supplier. On the other hand ordering for a period so short that the supplier cannot plan a stable manufacturing program and the usurption of the right to return unneeded shipments of parts are unfair to suppliers.

A certain amount of give and take is necessary to the satisfactory adjustment of these conditions. The cultivation of a spirit of mutual trust and confidence is the best way, for contracts will never do it.

Has No Recourse

Of course when the parts company signs a contract which specifically gives the purchaser complete freedom in the matter of releases and cancellations it has no recourse when a question of responsibility arises. The situation is complicated by the fact that producers of metals, fabrics and other such materials have often been able to impose selling terms calling for definite prices on definite quantities and definite delivery dates. Unless orders on these terms are placed the parts company has to pay higher prices for its materials.

The parts company therefore is justified in standing against the form of contract which is merely a statement of possible or estimated requirements over a certain period and naming a definite price but imposing no liability on the purchaser to accept stated quantities at stated times. The implied obligation upon the supplier is to manufacture parts and hold them in readiness for releases by the purchaser.

Indeed, in such a case the parts company has to assume the risk of fabricating items that may not be called for at all or within a reasonable time. Otherwise the company may not be able to comply with the order or release when it arrives.

An instance of this character of dealing between car manufacturer and parts company recently aroused considerable interest. The form of contract for purchases drawn up by the manufacturer provided that deliveries were to be made in accordance with releases, and that he would not be responsible for materials purchased or processed in excess of quantities specified in these releases as originally furnished or subsequently modified.

Here a little firm dealing won an important point for the parts suppliers. Some of them refused the contract without modification to protect their interests and the car manufacturer agreed to the modification. Subsequently the clause was changed on all contracts issued by the manufacturer. This again is confirmation of the fact that most if not all car factories are reasonable enough to see that they have to assume part of the risk involved in the fabrication of motor cars for a variable market.

Insisting on His Rights

It is important for the parts maker to stand up for his rights at the inception of business dealings with the car manufacturer. The purchasing agent these days wields tremendous power and in addition he is always under pressure from his company to bring down costs and secure whatever other concessions may be feasible. If a courageous position is not taken at the outset of a sale the buyer may feel that he holds the whip hand and may be in the mood to expect further allowances.

Numerous cases where the parts company has been able to obligate the purchaser for material on hand up to the full amount of the order might be cited. Where such a relation exists the car manufacturer is not likely to place his orders very far ahead and there is a constant problem for the parts maker as to whether to order materials in anticipation of production that may not be called for. Otherwise the flow of materials may be interrupted at considerable cost.

But here again by amicable relations with the customer it is usually possible to secure authority to purchase the materials. Few situations will arise between

two honorable manufacturers that cannot be settled satisfactorily by friendly negotiation.

In the all-important effort to take the gambling out of business and to reduce costs to the ultimate penny, the practice of providing for lower prices during the term of a contract in the event of lower material costs has become prevalent. One influential manufacturer last year saved several millions of dollars on a single item of equipment through such a contract.

This manufacturer, however, is as well known for his fairness with sources of supply as for his acumen in the business. The contract in question also called for higher prices should the cost of materials advance. There was thus no risk on this point for either buyer or seller. Some companies have sought to provide for higher costs but not for lower ones. The rights of the seller in such a case are clearly violated and it would be the worst of bad business not to insist upon the same measure of protection as is claimed by the buyer.

Prices for Variable Quantities

In the same category is the question of prices for variable quantities. Too often the buyer has obtained a price based on a much larger number of units than he actually purchases. At least one important producer asks for bids on different quantities ranging around his estimated needs, and the prices actually paid are based on the quantities ordered. While this producer has voluntarily installed this system there are numerous cases where the parts company has been able to conclude similar arrangements where the policy has not been definitely adopted by the manufacturer.

On the whole it appears accurate to say that there has been of late a tendency to eliminate the more unfair of the buying practices. The parts companies have been stiffening their backbones with gratifying results. There is certain to be continual jockeying for position, however, and the ultimate soundness of the parts industries will call for concerted firmness in the realm of sales terms and conditions.

The automobile industry has evolved rapidly and changes that necessarily affect buying are still going on. Forecasting of production and sales is on a better basis than ever and a car manufacturer who very often seriously miscalculates the immediate future of the market unmistakably reveals poor business judgment and organization. Accurate forecasting is helping the parts company to regulate production even where definite orders are not given far enough ahead to relieve all anxiety over purchases of materials.

New Models a Factor

But another factor in the evolutionary process is not so favorable to the parts maker and renders it all the more necessary for him to be nimble in his factory and careful in his sales. Not so long ago it was not uncommon for a car model to run two years and companies such as Ford and Dodge went along for several years without making important changes. Then the yearly model became general and now changes are frequently introduced on a semi-yearly basis. Even faster turns may be the rule before long.

Production quantities on each model are thereby curtailed and uncertainties increased. Production costs may be raised despite determined opposition by the car factories. The car manufacturers more than ever will want to be in position to make changes as rapidly as possible and at the lowest possible expense. As this is written the rumor arises that a leading manufacturer that has in recent years brought out a new model at an invariable time has notified suppliers of an impending out-of-season change to meet a prospective competitive situation.

Quick changes should mean more business for the parts manufacturer, with his specialized organization, his flexibility of production and his general purpose tool equipment. But unless he is careful and courageous, increased business will not mean more profits.

Whippet All-Purpose Coach

A WHIPPET coach embodying a concealed wide door at the rear and also detachable upholstery, to allow quick conversion from a conventional passenger car into a delivery unit, is now being displayed by Willys-Overland, Inc. The "All-Purpose-Coach," as the new model is known, lists at $850.

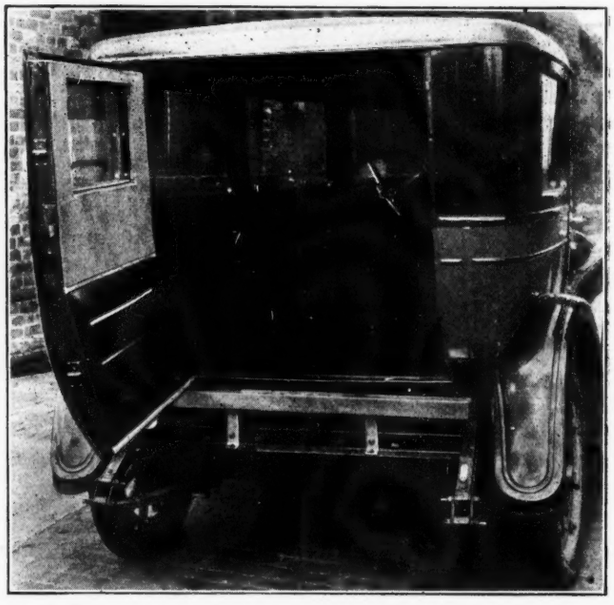
When used as either a five-passenger coach or a delivery car the exterior appearance is the same as the standard Whippet coach model except for the mounting of the spare tire, which is carried on a special bracket behind the left front fender instead of at the rear of the body. It is claimed that conversion from one type to another can be made in less than two minutes by one man without the use of any tools.

The wide single rear door is fitted with a concealed lock and the hinges on which it swings are hidden. The cushions of the rear seat do not press against the door but rest against a flat wooden member. The latter is fitted with hinges and folds forward when the cushions are removed to provide a smooth, level floor for the loading compartment.

Passenger car corduroy upholstery is employed in the "All-Purpose-Coach," but when used as a delivery unit and the rear cushions have been removed a heavy durable leather material is attached to the sides of the body by quick fastenings in order to protect the upholstery from damage.

The dimensions of the delivery compartment are 42½ in. wide by 39¼ in. long and 40½ in. high.

As there is virtually no evidence of the "All-Purpose-Coach" being a convertible car when used as a five-passenger coach, the officials of Willys-Overland, Inc., are looking for a large demand for this car from salesmen, small storekeepers, farmers and numerous others.



Whippet all-purpose coach with rear door open

Producing *the* Worms *and* Gears for Jordan *Model R*

Operations developed by Cleveland Worm & Gear Co. for this particular job are described. Gear placed in horizontal plane for hobbing. 23 teeth cut.

By K. W. Stillman

IN producing the worm and gears employed in the Jordan Model R custom job, the Cleveland Worm & Gear Co. has been able to fall back upon a number of years' experience in the production of worm gearing for truck axles and larger worm and gear sets employed in speed reduction units, so that this relatively new entry into passenger car assemblies has been placed on a production basis with very satisfactory results.

The gear employed in the Jordan driving mechanism is made from a modified S.A.E. 65 bronze, the blanks being cast and cored in permanent iron molds. The first machine operation performed on them is to turn, face the web sides and bore. This is all done on a Warner & Swazey turret lathe. Tolerance of .001 in. plus or minus is permitted in the width of the web.

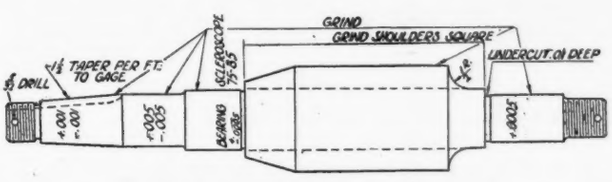
Ten splines, equally spaced about the bore, are next put in with a broach. The diameter of the broached hole is held to .002 in., minus .000. Distances between adjacent splines are also held to plus tolerance of .002 in.

Automatic Gear Hobber

The gears are hobbed in an automatic hobbing machine manufactured by Herman Pfauter, Chemnitz, Germany, and distributed in this country by O. Zernickow, New York. The most interesting feature of this machine is that the gear is placed in a horizontal plane and the hobbing cutter moves tangentially across it. Twenty-three teeth, left-hand, are cut to a circular pitch of approximately 1 in. The gear teeth must be held within limits so that when assembled with the worm there shall be not more than .002 in. plus or minus tolerance from the nominal center to center distances. Production rate from the hobbing machine is from eight to ten per hour.

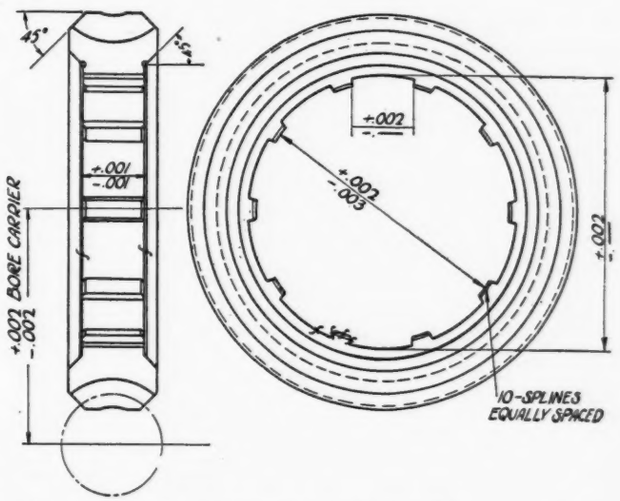
The worms are made from S.A.E. 2315 steel, drop forged. The bearing surfaces and tapers are cut on two automatic lathes, the floor to floor time through both operations being about 2.5 min. These operations are held to fairly close limits but as all surfaces are later ground final accuracy is not sought in the turning operations.

The threads are next hobbed on a modified Lees-Bradner hobbing machine. There are five left hand threads with circular pitch of about 1 in. and 25 deg. pressure angle.



Working drawing of Jordan worm

After hobbing the worm is heat treated and straightened and then receives three grinding operations. The straight journals are ground to limits of .0005 in. minus the nominal size while the tapered portion is ground to plus or minus .001 in. to gage. The threads are also ground and all shoulders ground square.



Jordan worm wheel drawing

In the next operations the ends of the worm are drilled and threaded and the piece is ready for inspection.

In inspection the worms and gears are usually tested together since that is the way in which they are to operate. In other words, a standard worm is used to test gears and a standard gear is used to test worms. Gear backlash is tested by placing the gear in engagement with a standard worm and measuring the amount of backlash by means of a dial indicator. Gears are also tested for noise by running them engaged with a standard worm under loads of varying amounts.

The principal inspection employed for worms is to check the profile of their threads. This is done by means of a master plug gage which is inserted in the threads and the variation from standard is indicated by the amount of light to be seen between the threads and the gage. They are also checked for the usual dimensions by means of snap gages and dial indicators.

Weymann Fabric Body *is* Standard *on* New Rover Six

Two-liter engine has overhead valves. Extra supply of oil, circulating with that from sump, is carried in gearset. Four-wheel brakes. Price low for British market.

By M. W. Bourdon

THE Rover Co., Coventry, England, is introducing a new light six which has a two-liter overhead valve engine with pushrod operation on orthodox lines, as distinct from the arrangement of the three-liter Rover four, which has an overhead camshaft operating one row of valves and transverse pushrods above the block for the other row.

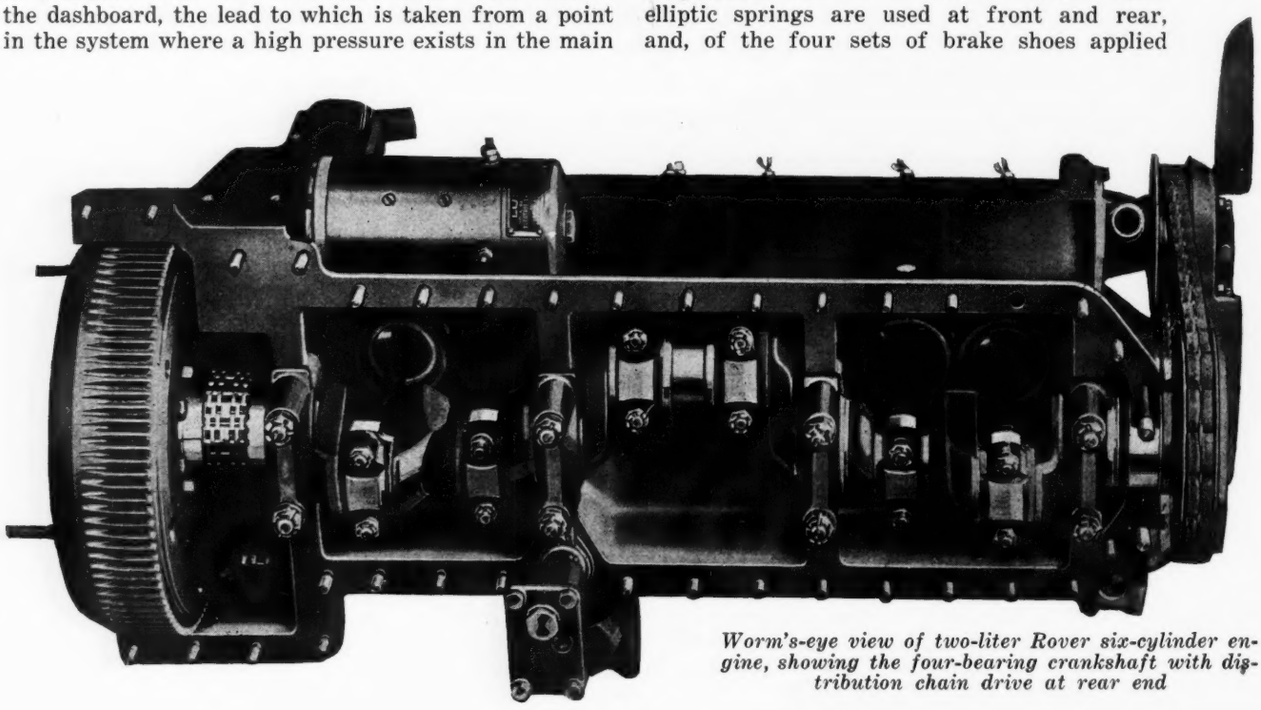
The new model has a unit powerplant with three speeds and central control for the gearshift. At the front is a single support, while at the rear, in line with the clutch casing, the support at each side is by short laminated springs with seven leaves, projecting laterally as brackets between the side rails and bearer arms. The bore and stroke are 65 x 101.6 mm. (2023 cc.).

Full pressure lubrication is used for the engine, and the sump holding two gallons is in communication with the clutch pit and gearset. The latter holds another gallon of oil and the three gallons are circulated continuously by the engine pump. Baffles occur between the three units. Filtration is effected first by the main filter, located accessibly for instant cleaning; most of the oil in circulation passes through this as usual, but in a shunt circuit is an AC filter on the front face of the dashboard, the lead to which is taken from a point in the system where a high pressure exists in the main pipe. Thus a proportion of the oil is always passing through the AC filter, though if the latter is neglected and becomes choked, filtration proceeds through the main filter as usual.

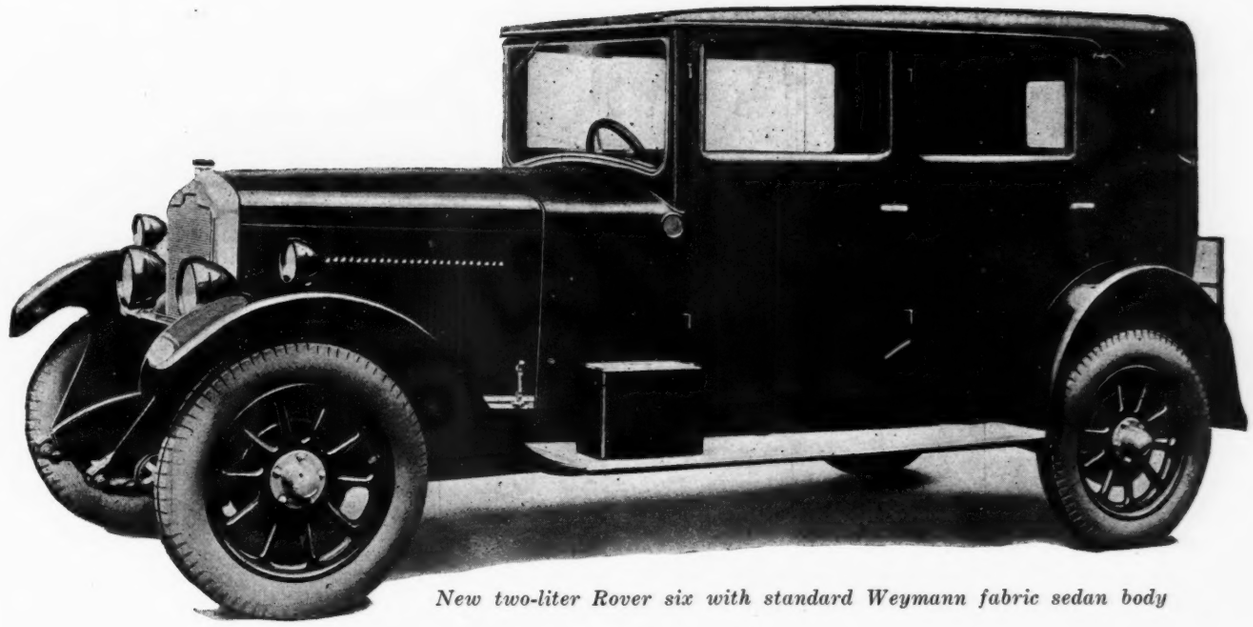
The four-bearing crankshaft has a Lanchester vibration damper incorporated in the fan driving pulley. The only front end drive is skew gearing for the distributor of the battery-coil ignition, the driving shaft of which is carried vertically up to the level of the cylinder head. The camshaft drive is at the rear end, between the rearmost crankshaft journal and the flywheel. A silent chain is used. This arrangement has been adopted to relieve the crankpins, webs and journals of camshaft driving torsion.

A dual induction tract is used, with two Stromberg carburetors; by this means an increase of speed (60 to 70) has been secured and better acceleration and slow-pulling.

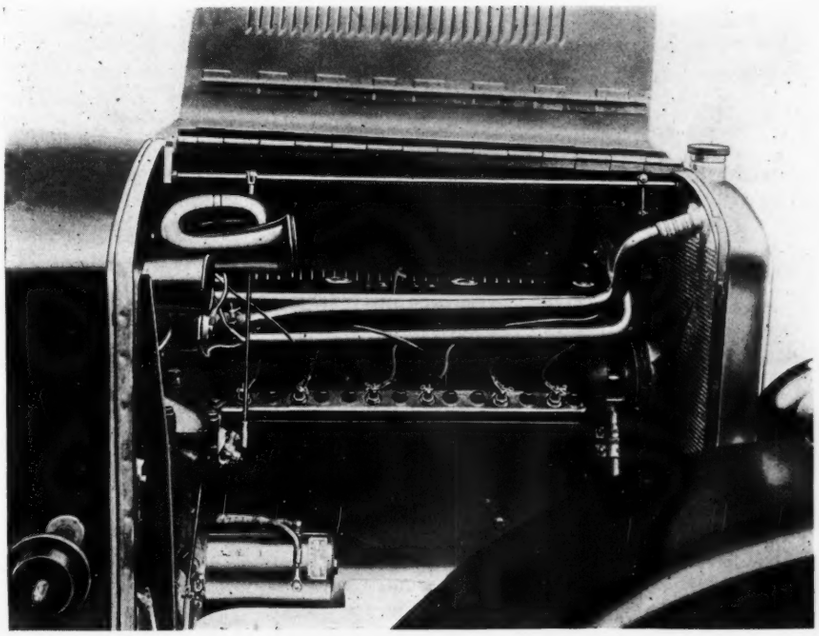
There is nothing unorthodox in the design of the transmission or suspension. The propeller shaft is carried in a torque tube, and the final drive is by helical bevels with a ratio of 5.3 to 1 in conjunction with 30 x 4.75 in. tires. Half-elliptic springs are used at front and rear, and, of the four sets of brake shoes applied



Worm's-eye view of two-liter Rover six-cylinder engine, showing the four-bearing crankshaft with distribution chain drive at rear end



New two-liter Rover six with standard Weymann fabric sedan body



Right side of Rover six-cylinder engine

directly by pedal, the rear ones can be actuated independently by the hand lever. No servo is fitted, nor have the shoes any self-wrapping effect. The front-brake actuation is on the Perrot lines with the inner ends of the camshafts supported on the frame. A point of note, however, is that the lever on the inner end of each front camshaft extends upward, with the result that the torsion of the front springs when the brakes are applied affords a self-energizing effect in proportion to brake pedal pressure. The benefit derived from this feature is pronounced in practice, and a driver strange to the car might imagine that the shoes were of the self-wrapping type.

The wheelbase is 118 in. and the track 56 in., while, complete with the Weymann type fabric sedan, the car weighs 2800 lb. Although other body models will be standardized, a specialty will be made of the fabric sedan, the framing of which is in accord with Weymann principles, having flexible joints, though departure from the original conception is evident in the rear quarters and back, where well-rounded panels occur. The roof is also well curved. Dummy stretcher irons are fitted at each side of the rear quarters. With this body the car will sell at £425, a remarkably low figure on British standards, considering the obviously high-grade character of the chassis and bodywork. The all-weather five-seater will be £410.

A novel option is offered to buyers of the fabric sedan, viz.: a roof of which nearly three-quarters, from the front end, can be folded back over the fixed rear part, leaving only the side rails in position. This is an entirely different arrangement from the sliding roof sedans, of which quite a number have been sold by British manufacturers during the past two years, and the principle of which has been applied to a Weymann sedan by Sunbeam. The Rover option will be provided at an extra cost of £20. It is of note that the engine hood is not covered with fabric, but is cellulosed, owing to the risk of the fabric peeling off at the front end, where it is, of course, subjected to a relatively high temperature.

THE two automobile show buildings on the Kaiserdamm in Berlin in which the Berlin automobile show was held last fall, have been sold by the German Automobile Manufacturers Association, for the account of which they were erected, to the City of Berlin (Bureau of Exhibitions). The cost of construction of the two buildings was 5,000,000 marks and the value of the site 440,000 marks.

Slow Progress in Plant Changes Delays *New Ford* Model

May not be in quantity production until about Dec. 1 and is not likely to be a factor in retail selling this year. General features of new car described.

By Lewis C. Dibble

THE new Ford car is still several weeks away. Predictions that it would be ready for presentation to the public in September now seems doubtful in view of the slow progress that is being made at the Ford factories in tooling up and otherwise making ready for mass production.

As a matter of fact it now seems almost certain that the new Ford car will not be a factor in retail selling this year.

The Ford Motor Co. is understood to have originally planned to make preliminary showings of the new model at the Michigan State Fair and to follow with similar presentations at county fairs throughout the Wolverine State. Because of the delays experienced it was deemed advisable to cancel these plans and from authoritative information which has been gathered in Detroit it appears that the new car is at least one and possibly two months away.

One report which seems very reasonable is that the Ford Motor Co. of Canada, which will follow the American plant by several weeks, will not be ready to enter production until about Jan. 1. Figuring on this basis, it is contended that the American plants of the Ford company will not be producing cars in quantities until about Dec. 1.

Overhauling of the Fordson plant to make ready for production of the new car is now absorbing the principal interest of Ford engineers. While it is true that units for the new model are in production at Fordson on a limited scale, approximately 80 per cent of the output at the present time appears to be replacement parts for the Model T. Much of this latter is being sent to Ford branches throughout the country to be held in reserve for replacement purposes on the Ford cars now in operation.

Exporting Model T Parts

Some Model T parts are also being sent to Ford plants abroad for assembly purposes. On this basis introduction of the new Ford to foreign fields will probably be delayed until after the company can be assured that it is first in a position to fill domestic demands.

Extensive overhauling operations are under way in the steel mills at Fordson. Of seven banks of blast furnaces, only two are being operated at the present time, while the others are being overhauled. One steel rolling mill is being operated. Despite curtailed operations in this division the company now has on hand an abundant supply of bar steel in various sizes.

It is interesting to note that Ford is in the process of utilizing the salvage steel which was reclaimed from the large fleet of discarded merchant vessels used during the war and which the company bought from the Government. The ships were taken to the Fordson plant from the Atlantic Ocean via the St. Lawrence River route and have been cut up and placed in huge piles. As the material is needed it is loaded onto flat cars by means of magnetic cranes and taken into the plant and unloaded by similar methods on a large traveling platform which carries it into a set of gigantic shears where it is cut up into pieces and made ready for the furnaces.

Machines Being Transferred

Tool makers are busy forming new dies and altering machines in anticipation of production changes. About 50 per cent of the machines in a number of departments are awaiting transfer to different departments and a considerable number are scheduled to be taken over by the service division for the production of Model T parts.

Perhaps one of the busiest departments at Fordson at the present time is the plate glass division, which is operating at full speed, at least during the day shift.

A limited number of new engines are being assembled at Fordson and engine parts are now on the production lines, though in small numbers. Stampings for various parts of the new car are also being made, though in small quantities. These include such parts as fenders, etc. It is understood that the company has also gone outside of its own organization for certain operations such as stampings, and in this connection the Briggs Manufacturing Co. is mentioned as having obtained orders for certain stampings.

Retooling operations are not alone confined to the Fordson plant but are going forward in all Ford factories throughout the country. The final assembly line has been removed from the Highland Park plant and taken to Fordson. The Highland Park plant has also been engaged in assembling a number of Model T parts which have been produced at Fordson, but as soon as the company can rearrange its manufacturing schedule it is said that even the assembly operations will be moved to Fordson. This will release still more space at Highland Park.

Henry Ford is understood to have in mind utilizing

the Highland Park plant for the manufacture of a number of materials used in Ford automobiles. Already he is making such items as tires, batteries, plate glass, lacquer, etc., at Highland Park, and it is said that these operations will be expanded.

It is also possible that fabrics required for upholstery purposes will be made at Highland Park instead of purchased from outside sources.

Lacquer Plant Installed

When the Ford company first started applying lacquer finish to its cars it was necessary to obtain the material from paint manufacturers. A plant which was built at Highland Park for manufacturing lacquer top finishing material has gradually taken on the manufacture of lacquer body finishes and now supplies a substantial percentage of finish used by the company. The company, however, still buys a certain portion of its finishing material from outside sources.

An interesting situation is developing in Ford's lacquer plant, it is said, in that the company is experimenting extensively with the use of synthetic dyes from Germany. To lessen the high duties on these commodities, the liquids in the dyes are evaporated off before shipment from Germany, making it possible to send large quantities in a concentrated form. How practical the use of these German materials will become remains to be seen.

While considerable delay is being experienced in bringing out the new Ford car, Ford dealers need not be a bit backward in assuring the public that the new car will be a much smoother operating car than its predecessor. At least, engineering principles being embodied in the new engine should result in a vast improvement over the Model T.

The crankshaft in the new engine is much heavier than that used in the Model T and is counter-balanced by the use of circular crank cheeks joining the crankpins to the three main bearings. The cheeks between the first and second and third and fourth crankpins are still of the conventional type and are not provided with counter-balances. Except for these two cheeks the new crankshaft is completely machined.

Another feature which should tend to make a quiet running motor is the fact that there is no idler gear in the timing gear chain and the crankshaft gear is non-metallic and of large diameter.

The engine is the conventional L-head type with pump cooling circulation with a water riser in the cylinder head. A new single-piece two-blade propeller type fan of sheet duralumin will also be used. The oil pump will be located in the lowest point of the crank pan. The new type flywheel is much lighter than the previous one and is designed to make possible the use of a dry disk clutch.

It is understood the bore of the new job is 3⅞ instead of 3¾ in. and the stroke is about ½ in. longer. Cast-iron pistons with convex heads will be utilized, while valves will be of steel.

Information at hand indicates that other important units will be as follows:

Camshaft—Five bearing, which are 1/16 in. larger in diameter than the old type.

Generator—New design equipped with oilless, self-lubricating bearings. The old Ford starter will be retained.

Transmission—Selective type, of an improved steel, practically a duplication of that used in the Lincoln, only smaller. The clutch will also be patterned after the type used in the Lincoln.

Rear axle—Banjo-type housing, welded.

Front Axle—Heavier and with a lower drop to bring car closer to the ground.

Springs—The springs will be similar to those now on the Model T, only more and thinner leaves will be utilized. The springs will be flattened out to swing the car closer to the ground.

Wheelbase—104 in.

Wheels—Wire wheels of smaller diameter than old ones will be offered as standard equipment. Full balloon tires will be used.

Hubs—Larger, with roller bearings in wheels.

Brakes—Four-wheel, mechanical, internal expanding. They will be equipped with two-piece steel brake-shoes on each drum, presenting a total braking surface of about 144 sq. in. Emergency or parking brakes will be mounted on two rear wheels.

Fenders—Wide full-crown fenders of heavier gage metal will be on the new cars.

Gas tank—Built into body under cowl.

Radiator and hood—Will be larger with rounding lines.

It is also understood that the car will be equipped with snubbers and the steering gear will be of irreversible type.

In general appearance the new car will represent a departure from the Model T. The new axles and flattened springs will throw the machine much closer to the ground and the full-crown fenders and more graceful body, hood and radiator lines will produce a car much more pleasing to the eye than its predecessor.

$15,000,000 for New Tools

In a statement issued to employees through its house organ, the *Ford News*, Ford Motor Co. reveals that it is costing the company $15,000,000 to retool plants in preparation for the new car.

The company has been operating on a four-day-a-week basis since last spring and has just gone on a five-day-a-week basis. The statement says:

"Total expenditure in the purchase and alteration of tools, together with the cost of constructing a single set of dies preparatory to building a new Ford car, has amounted to $15,000,000 before a wheel has been turned. Two of the factors included in these preliminary steps were the purchase of 4500 new machine tools and alteration of 15,000 more. These two items involved an expenditure of nearly $10,000,000.

"Preparing to produce the rear axle alone necessitated the construction of an entire group of machine tools. One hundred and sixty-six gear generating machines were completely rebuilt at a cost per unit of $3,000 to produce two gears included in the rear axle assembly.

"A number of hot metal spinning machines were purchased at a total cost of about $60,000. Other mechanical equipment, consisting principally of punch presses, was also required, the presses costing approximately $1,000,000.

"Alterations and purchase of machinery for production of the new steel-spoked wheel cost between $600,000 and $700,000.

"The preparations involve 300 welding machines, many of them built especially for Ford purposes, at a unit cost of from $700 to $9,000 each.

"Four million dollars of the total expenditure was spent for new machine tools. About $4,500,000 has been expended for altering or rebuilding tools on hand.

"A total of 43,000 machine tools were already in company plants before preparations began. Of these, 32,000, or nearly 75 per cent, were production tools. More than 50 per cent of all tools have been rebuilt."

Chemists *are* Blocked *in* Further Efforts *to* Improve Tires

Present conditions require them to devote energies mainly to development of new sizes. Chemistry's part in automotive industry discussed at Detroit.

By A. F. Denham

THIS is a report of the symposium on "Chemistry's Contribution to Automotive Transportation," which was held as a feature of the convention of the American Chemical Society in Detroit last week.

Each of the papers in the symposium was prepared by a chemist who has been active in some field of development related to the automotive industry. The subjects dealt with include tires, fuels, metallurgy, glass, leather substitutes, body finishes, synthetic resins, storage batteries, lubricants, spark plug insulation, anti-freeze compounds and the treatment of clay roads.

Brief digests of the different papers will be found in the article.

LACK of standardization of tire sizes has again become the bane of the tire industry. During the two or three years preceding the advent of the balloon tire, reduction in pneumatic casing sizes made it possible for engineers and chemists of the rubber tire companies to concentrate on advancement in tire design and composition, resulting in tremendous increases in tire life and reduction in manufacturing costs.

Since the general adoption of the balloon tire, however, according to a paper prepared by W. C. Geer, of the B. F. Goodrich Co., and presented before the American Chemical Society convention, held in Detroit Sept. 5 to 10, automotive vehicle designers have called for new size after new size, until at present 103 sizes of pneumatic tires are required by the market.

Under these conditions, with new sizes being called for continuously, engineers and chemists of rubber companies are in a position where most of their energies have to be devoted to the design and production of these new sizes. Until a reduction of the number of different sizes is made there can be but little material advance, according to Mr. Geer.

Mr. Geer's paper formed one of a series given in a symposium on "Chemistry's Contribution to Automotive Transportation." Practically every phase of automobile construction was touched upon in this symposium, ranging from upholstery materials to spark plug insulation, and covering such items as metallurgy of motors, non-ferrous metals and alloys, aluminum and its alloys, abrasives and grinding, electroplating, automobile glasses of all types, coated textiles, exterior finishes, storage batteries, synthetic resins, motor fuels, automotive lubricants, anti-freeze compounds, and roads.

In his paper on "The Contribution of Rubber Chemistry to Automotive Transportation," Mr. Geer also outlined the economic necessity which has called for the use of reclaimed rubber. The ratio of reclaimed rubber to crude used has followed closely the crude rubber price. If it were not for the present use of reclaimed rubber, which so far in 1927 equals about 50 per cent of the crude rubber used, there would not be enough crude to supply the demands of the automotive industry. While reclaimed rubber can not and is not generally used in place of crude, chemists have found that when it is used in combination with special pigments and fillers, a high quality product is obtained, in some cases even better than that obtained with crude rubber, according to Mr. Geer.

The most striking figure in Mr. Geer's paper on the advance in tire design, attributable to the chemist, is that in 1910 there were required for replacement purposes 16 tires per car, while in 1926, after subtracting four tires per new car produced, only 2.9 tires per car in service were required.

The increase in life shown by this figure is not due entirely to the establishment of good roads, as good roads are largely offset by higher power and speeds, and decrease in tire diameters. Total increase in life inherent in the tire is estimated by Mr. Geer as being in the neighborhood of 300 per cent in the last 15 years.

Other important improvements made in the rubber industry in recent years include the development of anti-oxidants in rubber tires, which have served to decrease the aging effect of the atmosphere. Tires which are on shelves 10 years now are just as good as tires which had been on the shelf one year around 10 years ago. Further developments in the rubber field, looking toward wider applications in the future, may be expected along the lines of rubber-containing paints for airplanes, to which water and ice will not cling, a much needed development in the aeronautical field. Rubber hose for gas and oil lines in automobiles, impervious to these fluids, may also be expected in the future, according to Mr. Geer.

Cracked gasoline may be the final solution of efforts to develop a motor fuel which will enable motor car

designers to increase engine compression ratios to the desired limits of about six to one, according to J. B. Hill, chief chemist of the Atlantic Refining Co., in his paper on "Motor Fuels." This search for an inherently anti-knock gasoline at standard gasoline prices is one of the biggest problems before the petroleum field at present.

While there is no immediate prospect of a gasoline shortage, according to Mr. Hill, the time is coming when an efficient substitute will have to be developed. Progress in Germany along these lines is well worth watching. The Burgius process, consisting of the hydrogenation of coal under high pressures, and givin gabout 30 gallons per short ton, is already on a commercial basis and has proved economical in Germany where gasoline prices are high. The Fischer process, consisting of the production of synthetic methanol from water gas also shows promise, although it has not yet been possible to produce it commercially.

Cracked gasoline has now definitely come into its own, according to Mr. Hill, who stated that cracked and straight run gasolines are being produced in about equal proportions. Clogging of fuel systems due to gummy substances in cracked gasolines have been largely exaggerated, according to Mr. Hill, who claimed that such gummy substances are not present in sufficient quantities unless cracking is carried on at too high temperature.

Chloral Napthalene Beneficial

During the discussion of this paper it was claimed that the addition of chloral napthalene to gasoline, even in the absence of tetra-ethyl lead compounds, was beneficial by providing lubrication for exhaust valve stems.

In his opening address at the smyposium, Dr. T. A. Boyd of the General Motors Research Laboratories, who acted as chairman, pointed out that there are two problems in the making of any machine, "How to make it" and "What to make it out of." Since these problems are closely interrelated, and the chemist is one of the chief factors in the second problem, the position of the chemist in the automotive industry is a highly important one. Dr. Boyd quoted extensively from "Facts and Figures," published by the National Automobile Chamber of Commerce, to show in what tremendous proportions the automotive industry consumes raw materials as compared to total production of these materials.

J. A. Mathews presented the first paper in the symposium on "Metallurgy of Motors." Mr. Mathews stated that in the development of new steels the chemist was still far ahead of demands by the automotive industry.

In the absence of W. H. Gillett of the Bureau of Standards, his paper was read by Dr. William Blum. It dealt with "Miscellaneous Non-Ferrous Metals and Alloys in Automotive Transportation." This paper called attention to the continuing use of ordinary steel in such prominent parts of the automobile as windshield frames, with the use of nickel-plated steel bolts and screws in places where moisture can collect, leading to unsightly rust stains. Mr. Gillett claimed that a large proportion of owners now do not use a garage and that these would prefer to pay the slightly extra initial expense for monel metal or other non-rusting materials in prominent places.

As possible advances in metallurgy which are needed at present, Mr. Gillett suggested the development of a method enabling the stamping out of battery plates, which has not yet been possible, and the development of a tinless solder which would release this much-needed metal for other uses. Bearing research is also needed, according to Mr. Gillett. In aircraft engines, bearings limit the useful life of the engine. It was suggested that the theory which requires the use of hard particles in a soft matrix in bearings might be discarded, since it is now possible to give bearings a much higher finish and better aligning.

Aluminum and Its Alloys

Silicon alloys of aluminum and heat-treating of aluminum alloys is coming in more and more in the automotive industry, according to Francis C. Frary, director of research, Aluminum Co. of America, in his contribution "Aluminum and its Alloys." L. H. Milligan, of the Norton Co., in his paper on "Abrasives and Grinding," stated that at present $8,000,000 worth of grinding wheels are used by the automotive industry. Mr. Milligan pointed out that each type of grinding operation represented a different problem, and that a great variety of different sizes of abrasives are necessary to fill all demands, since the most efficient types of abrasives and crystal sizes differ for each operation.

It has not been thoroughly demonstrated as yet that cadmium plating is superior to zinc, except for small parts requiring accurate dimensions, according to Dr. William Blum, of the Bureau of Standards, in his paper on "Electroplating in the Automobile Industry." The idea of using chromium plating for headlight reflectors may have some value due to its resistance to tarnishing, although initial reflectivity is not as high as that of silver plating. Dr. Blum warned against careless using of chromium plating, since, if not absolutely perfect, it will actually accelerate corrosion due to electrolytic action. While the hardness of chromium plating makes it highly advantageous for tools and gages, it is also quite likely that its ability to withstand abrasion may contribute toward its eventual use in place of case-hardening.

A considerable advance in plating solution composition is necessary, however, before more widespread adoption of chromium plating, due to the poor throwing power of present solutions, which are practically identical with those used experimentally in the 19th century. Rubber plating according to Dr. Blum is another subject meriting much study and research.

In his paper on "Automobile Glasses," E. Ward Tillotson stated that it was not likely that chemical changes in glass would provide any better qualities as to hardness and toughness. Laminated glass, with two or more sheets, using celluloid sheets between them, and assembled under hydraulic presses, may, however, become more widely used. Cost of manufacture of such glass will of course remain higher than ordinary plate glass. The use of lead sulphite on rear view mirrors, coated by electro-deposition, is coming into favor. Such mirrors have about 40 per cent less reflectivity, but the absorption is largely confined to the more luminous portions of the spectrum.

Leathers and Textiles

Following on a paper by Norman Hertz, vice-president of the Max Hertz Leather Co., dealing with "Chemistry's Contribution to Leather Manufacturers," Dr. Hamilton Bradshaw of the DuPont Company gave a paper on coated textiles. According to Dr. Bradshaw, rubber-coated fabrics are replacing pyroxylin fabrics for top coatings, with the exception of colored sport model tops. One of the factors leading to this development is the lower cost of production possible at present. The use of artificial or imitation leather for open car upholstery is largely a question of economic necessity, according

to Dr. Bradshaw, who stated that there was not sufficient leather available if all open cars were to be upholstered in real leather.

H. C. Mougey, of the General Motors Research Laboratories, in his paper on automobile finishes, enumerated several desirable developments. One of these is a better method or material for lacquering exposed wood parts, finishing of which parts is in an unsatisfactory stage. For refinishing cars a primer which hardens in thicker layers is desirable, to effect reductions in both cost and time. A cheaper method than hand-rubbing of lacquer finishes should also be developed, according to Dr. Mougey.

Bodies of Molded Resinoid

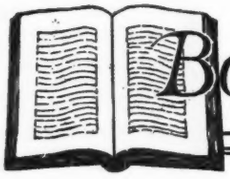
The possibility of molding automobile bodies of synthetic resinoid in the future was suggested by A. V. H. Mory, director of research, Bakelite Corp., in his paper on "Synthetic Resins." There are also large future possibilities for the application of synthetic resins in covering materials and finishes. Automobile bodies of synthetic resinoid would have the advantage of very greatly reduced weight with high strength. Manufacturing cost would also be considerably lower.

An outline of the development of the storage battery was given by W. L. Reinhardt, chemical engineer of the Willard Storage Battery Co., in a paper on this subject. In the absence of Arthur S. Watts, professor of Ceramic Engineering, Ohio State University, his paper on "Spark Plug Insulation" was read by Wheeler G. Level, of the General Motors Research Laboratories. Prof. Watts in his paper stated that porcelain was the only important inulating material for spark plugs today. Fued quartz and organic insulators have physical characteristics which render them undesirable, while glass is too brittle.

One of the major problems before the lubricating oil manufacturers, according to L. W. Parsons of the Tidewater Oil Co., who presented a paper on "Chemistry and the Development of Automotive Lubricants," is the production of high-grade lubricants from low crudes. Regarding the much needed tests for comparing lubricating qualities of different oils, Mr. Parsons stated that no satisfactory test had as yet been devised, but that considerable valuable data had been gathered and that there was some promise of eventual development of such a test.

Characteristics of various anti-freeze compounds was the subject matter of a paper by D. B. Keyes, professor of Industrial Chemistry, University of Illinois. Mr. Keyes stated that at present the alcohols were most satisfactory, with methyl alcohol leading the list. Universal adoption of glycerin is impossible due to its not being available in sufficient quantities. Ethyline glycol has better anti-freeze characteristics than straight glycerin, according to Mr. Keyes, in that it has a low partial pressure and lower viscosity.

The concluding paper of the symposium, dealing with "The Chemist's Contribution to Roads," by Charles M. Upham, director of highway research, North Carolina State Highway Commission, called attention to the need of developing a means to treat clay in such a way that it can be drained and reduce volumetric changes to a minimum, as well as improve bearing qualities in wet weather and enable it to be shaped by road machines. Such a development would enable the improvement of this country's unimproved roads, which at present still form 86 per cent of the total, and would assist materially in relieving highway congestion at a reasonable cost.



Books for the Business Bookshelf

Marketing Methods

Principles of Marketing. Harold H. Maynard, Walter C. Weidler and Theodore N. Bechman. The Ronald Press Co., New York. 682 pp. $4.50.

THIS book has been written primarily for college students and therefore contains considerable material which will not be new to the reader at all acquainted with marketing practices. It covers the subject rather completely, however, and should prove helpful to those who might wish to extend their information in regard to general marketing principles. The book discusses the various methods of distribution with fairly detailed studies of the place of retailers and wholesalers of various types in the system, the most commonly used purchasing practices and the principles underlying them, transportation and storage of materials and various other subjects which are included in the broad interpretation of the term "Marketing."

Controlling Personnel

Personnel. George R. Hulverson. The Ronald Press Co., New York. 400 pp. Illus. $4.50.

PERSONNEL problems are receiving an ever increasing amount of attention on the part of industrial executives as they realize that the human element in their organization is of great importance to its success but of considerable complexity. Books like the present are welcome in attempting to place on a more or less scientific basis the task of handling personnel, which has too often been essayed by rather crude methods. Mr. Hulverson discusses in order the various problems which must be met in securing, training, remunerating and otherwise organizing the personnel of a company. His remarks on job analysis and job evacuation are particularly appropriate since these two items, which appear to be of a major importance in personnel work, have received considerably less attention in the past than they might well deserve.

Purchasing of Materials

Purchasing. W. N. Mitchell. The Ronald Press Co., New York. 385 pp. Illus. $4.50.

THIS volume is made up mainly of a review of the general principles upon which purchasing practice is based. In the early part of the study is divided according to the type of commodity being considered, that is, whether raw material, semi-manufactured, etc. Later there are a number of chapters devoted to such subjects as general buying policies, planning and budgeting purchase requirements and inventory control principles. There are also several chapters describing routine methods of carrying through purchases. While the book contains no great number of new ideas it is an interesting and readable summary of accepted purchasing practices and principles.

C. J. Glidden, *First* to *Circle* Globe in Automobile, Dies

Charles J. Glidden

Gained fame in United States as donor of the famous Glidden Trophy to encourage reliability tours.

A FIGURE of prominence in the automobile world two decades ago passed with the death Sunday, Sept. 4, of Col. Charles J. Glidden, of Glidden Tour fame, at his home in Boston. The end came after an illness of more than a month. He was 70 years old.

It was in 1900 that Mr. Glidden retired from active business with a comfortable fortune—he had been associated with Bell in the development of the telephone—and turned his attention to automobiles as a means of satisfying his personal desires for leisurely travel. In 1903 he made a tour of some of the principal European countries in an automobile, and was the first man to take an auto beyond the Arctic Circle in Sweden. That feat attracted considerable attention at the time. He took his wife with him on the tour and they both enjoyed it so much that they determined to make a tour around the world the following year, using their automobile wherever practicable.

For this purpose he had built an extra set of wheels with steel rims and flanges to be used on railroads wherever that was practicable. He proved conclusively the success of that idea. He started out from Boston and went as far as Minneapolis, Minn., over the highway—none too good at that time—on rubber tires. Then he put the other wheels on the car and rode on the rails to Vancouver, B. C.—1803 miles on railroad tracks; the first time such a thing was done. That run was made in 60 hours.

They went by steamer to Yokohama and toured Japan. They visited China, the Philippines, Sumatra, Java, Australia, Tasmania and New Zealand; then back through Ceylon and India and up through Asia to Jerusalem, which they entered by the Jaffa Gate, and were greeted by 10,000 people who had never heard of such a thing as an automobile.

First Car in Many Countries

In fact, Mr. Glidden's automobile was the first seen in many of the 39 countries which he visited in his first tour and the round-the-world tour. He was gone about seven years, and wrote about his trip as he went along for the Boston *Globe*.

In his automobile, Mr. Glidden reached the most northerly and southerly points in the world possible to reach by automobile—the Arctic Circle in Sweden and Ward's Parade in New Zealand, the two points being 12,000 miles apart.

Royal receptions were given to Mr. and Mrs. Glidden during their automobile tour around the world, in the course of which he took 2500 photographs and wrote 250,000 words descriptive of the trip and its trials.

This tour prompted him to offer a trophy to the American Automobile Association in 1904 to encourage the use of the automobile in the United States. For eight years the Glidden tour was an event of great importance in the automobile world. At times there were as many as 100 cars in these tours, holding 400 persons, with special railway trains and sleepers for accompanying friends.

The Glidden Tours had a two-fold object—to demonstrate the reliability of the automobile in road service (as the Ford Reliability Airplane Tours are demonstrating the practical worth of the airplane today), and to promote the building of suitable motor highways throughout the country. They were conducted under the supervision of the American Automobile Association and each year a new route was selected. The first tour, in 1905, was from New York city to Bretton Woods, N. H., and return.

Southern and Western Routes

The 1906 contest started at Buffalo, N. Y., penetrated Canada as far as Quebec and finished at Bretton Woods, a distance of 1135 miles. The following year the route took in Cleveland, Chicago, Baltimore, Philadelphia and New York. In 1908 Buffalo, Pittsburgh, Philadelphia, Albany, Boston, Bretton Woods and Saratoga were covered. Other runs in later years extended as far west as Denver and as far south as Dallas, Tex., and Jacksonville, Fla.

Some idea of the popularity of the tours can be gained by a perusal of the 1911 entry list, which shows 76 cars entered by owners from all parts of the country. Thirty-four makes were represented, ranging in price from $590 for a Ford to $6,000 for a Thomas.

Mr. Glidden was also keenly interested in aeronautics. In 1910 and 1911 he was one of the officials at the Harvard-Boston aviation meet at Squantum. He had many interesting experiences in balloons. He and A. R. Shrigley organized the Aero Club of New England, the first aero club in the United States.

During 26 months' army experience in the Air Service during the World War, as president of aviation examining boards, he approved 6000 young men, many of whom served as balloon pilots and aviators at home and abroad. He was appointed lieutenant colonel in the Aviation Reserve Corps Aug. 28, 1924.

Mr. Glidden was a man of great energy and versatility. He was always cheerful and good-natured; lived an extremely active life; had unbounded faith in himself and was successful in most of his undertakings.

Fig. 1—An indexing fixture holding two flywheel housing castings is used at the Paige plant

Fig. 2—The final operation is to bore the housing main bore in alignment with the main bearing holes in the crankcase

How *Flywheel* Housings *are Finished* at the *Paige* Plant

Work-holding fixture which is capable of holding two castings makes milling operation practically continuous with no time being lost for loading and unloading.

RATHER complex machining operations are necessary in finishing flywheel housings, and methods differ so greatly in various plants that a detailed study of how one manufacturer handles this job may suggest ideas to others. In the Paige plant several of the machining methods employed on this part are of particular interest and will be described in some detail.

The first operation on the casting is to straddle mill the cylinder and transmission faces. This work is performed on a 48-in. Cincinnati duplex milling machine. On the transmission face, 1/32 in. is allowed for finish turning and on the cylinder face .010 in. is left for finish grinding.

The most interesting thing about this particular job is the work-holding fixture which is illustrated in Fig. 1. It consists of an indexing table capable of holding two flywheel housing castings. While one casting is being milled the casting which has just been through the machine is removed and a rough casting put in its place. By use of this fixture the milling operation is practically continuous with no machine time being lost for loading or unloading.

Two dowel holes are next drilled and reamed in the cylinder surface, this work being done on a Hamilton sliding head drill press. A jig is used for locating these holes and they are held within .001 in. limits.

The transmission pilot hole is next rough bored on a Colburn heavy-duty drill press with .005 in. being left for finish boring. Oil pan surfaces are then milled on a Milwaukee plain milling machine. The casting then goes to a Bausch multiple spindle drill press equipped with 20 spindles where a number of tap holes are drilled.

The next operation is the finish grinding of the cylinder surfaces which is done on a Blanchard rotary surface grinder. A Garvin tapper is then utilized to tap and countersink holes drilled in a previous operation.

The five cylinder screw bosses are then back spotfaced on an American radial drill press, and on a similar machine and a Cincinnati-Bickford radial drill press the clutch yoke shaft hole is drilled, bored and reamed. Next the casting goes to the bench where the clutch yoke shaft hole is line reamed by hand to limits of .0005 in.

The motor supports are milled on a Hendley milling machine and the housing is placed in an American Radial drill press where the tap holes in the arms are drilled, counterbored and tapped and the brake lever stud boss is drilled, reamed, tapped and spot-faced.

Final drilling and tapping operations are performed on sensitive radial drills, Hammond and American being used for this purpose. Three drilling machines are employed for this work and the jobs include drilling and tapping three holes in the arm, drilling and tapping five holes in the rear faces, drilling and tapping six holes in the bottom surfaces; drill, spotface and tap one hole and set studs in the holes in the front face, and drill and tap two timing pointer holes.

The final operation on the flywheel housing is of special interest and is illustrated in Fig. 2. The completed casting is assembled with an engine and the main bearing hole is rebored with the bearing holes in the crankcase used as guides for the boring bar in order that the housing hole will be in perfect alignment.

Just Among Ourselves

List of 100 Books Becoming Famous

REQUESTS for the Antioch list of 100 books on subjects concerning which an educated man might feel the need of information continue to roll in every day. Now the outlying districts are beginning to be heard from. Canada and Spain provided requests this week, the total number now having reached 100, thus making it necessary for the mimeographing department to get busy again. The Canadian request, by the way, referred to "the now famous list of 100 books." Comments on the list have been arriving also, but very slowly. From those comments received, however, the indications are that the average automobile executive, engineer or production man apparently finds himself in the same boat with ye editor; he hasn't read enough of the books in the list to be able to get a good foothold for commenting. And not being an editor, this average automotive man finds lack of familiarity with the subject something of a hindrance to the making of comments.

* * *

Wanted: Authors to Write Three New Books

ONE recipient of the list finds it "a little bewildering" and confesses to having read but one book in the list, but points out quite properly that there are plenty of parallel books which might have been chosen in place of those listed. Another does what we have thus far had great difficulty in restraining ourselves from doing, namely, suggesting certain additions which we think just ought to be in any list whether or no. M. Udale of Detroit notes the absence of the following which he apparently thinks should be included: "Les Colloids," by P. Barry, a French book on colloidal chemistry; Hobhouse's "Democracy and Reaction"; Carlyle's "Frederick the 9th," and Sam Butler's note books. One reader suggests books which haven't been written yet. F. Neale of Christensen Air Brake says three more books are needed, one on the application of art to engineering; one on electro-chemistry which will be readable by the average engineer; and a third on the art of utilizing leisure. Well, we will agree to buy a copy of each of these books when some capable body writes them; we just wonder if someone else hasn't already run across an existing volume which would fill the bill on electrochemistry.

* * *

Engineer Fears "Mental Indigestion"

ONE important chief engineer, who may go nameless for the moment, remarks that while the list is interesting, contemplation of it makes him "somewhat fearful that an injudicious use would result in a rather bad case of mental indigestion." D. J. McAdam, Jr., writing from the engineering experimental station of the U. S. Naval Academy, feels that "if the list was intended for men such as executives of automobile companies it is well adapted for its purpose. He adds that he doesn't see that it would be necessary to read the lives of Pasteur and Lister to understand sufficient modern hygiene and sanitation, but that otherwise he thinks the "Medicine" part of the list is excellent. Strange how opinions differ. That is true undoubtedly, but it is quite conceivable that these two books along with "Microbe Hunters" would leave a more lasting impression on the average executive or non-medical man than the rest of the list put together and that, from the standpoint of mental stimulation, the rest of the list might almost as well be left out.

* * *

Fiction Shouldn't be Crowded Out

WE can't get away from our personal feeling, though, that mental stimulation rather than mere accumulation of information is the best basis for selection of books for general reading by the average man; also that no exclusively non-fiction list should be permitted to take up all of a man's spare time for reading. The best fiction of literature frequently contains more truth about life and impresses that truth more forcibly than a large load of text books—and this is no argument against a reasonable amount of reading for purely informational values.

* * *

S.A.E., Aberdeen, Tennis and Big Bill

SOMETIMES it is very difficult to work things around so that the ideas which interest us most at the moment can be given a proper automotive angle. We're especially troubled that way right now, so here's a strenuous effort. The S.A.E. is going to make a visit to Aberdeen proving ground on Oct. 6 to see what's going on in an army ordnance way. Army ordnance, of course, is developed under the supervision of the War Department, of which Dwight Davis is secretary. Mr. Davis is the donor of the Davis Cup, the trophy for international tennis competition. We saw Big Bill Tilden, premier tennis player of all time, win a Davis Cup match from Cochet yesterday and he was well-nigh perfect; there is no thrill in the world for us quite comparable to that of seeing Big Bill at his best . . . And thus it becomes plain that the S.A.E. visit to the Aberdeen proving ground on Oct. 6 will be a very interesting and informative event.—N.G.S.

New Developments—Automotive

"Mil-waukee-Mil" Miller

KEARNEY & TRECKER CORP., Milwaukee, Wis., announces a new production milling machine which has been named the Mil-waukee-Mil. It is furnished in two models, the Simplex and the Duplex.

Both machines are built on the new unit plan, which is said to mark an innovation in machine tool design. A customer may order only such units as are necessary for any particular milling operation. Starting with the plain machine with one set of pick-off gears, it can be built up by units until it becomes completely automatic, with every possible combination of intermittent table feed, power rapid traverse, spindle start and stop control, and even with quick-change feed and speed gear boxes.

New features include a double housing for the spindle block, with no overhang, a double over-arm support for the arbor, roller bearings throughout the drive, including the main spindle, a new planer-type table, automatic flood lubrication for the spindle bearings and all mechanism in the bed (including the table ways), and a completely-inclosed motor-in-bed or belt drive.

The outstanding features of the new Mil-waukee-Mil is its design on the unit system. This is a development of Kearney & Trecker's plan of applying special attachments to standard machines.

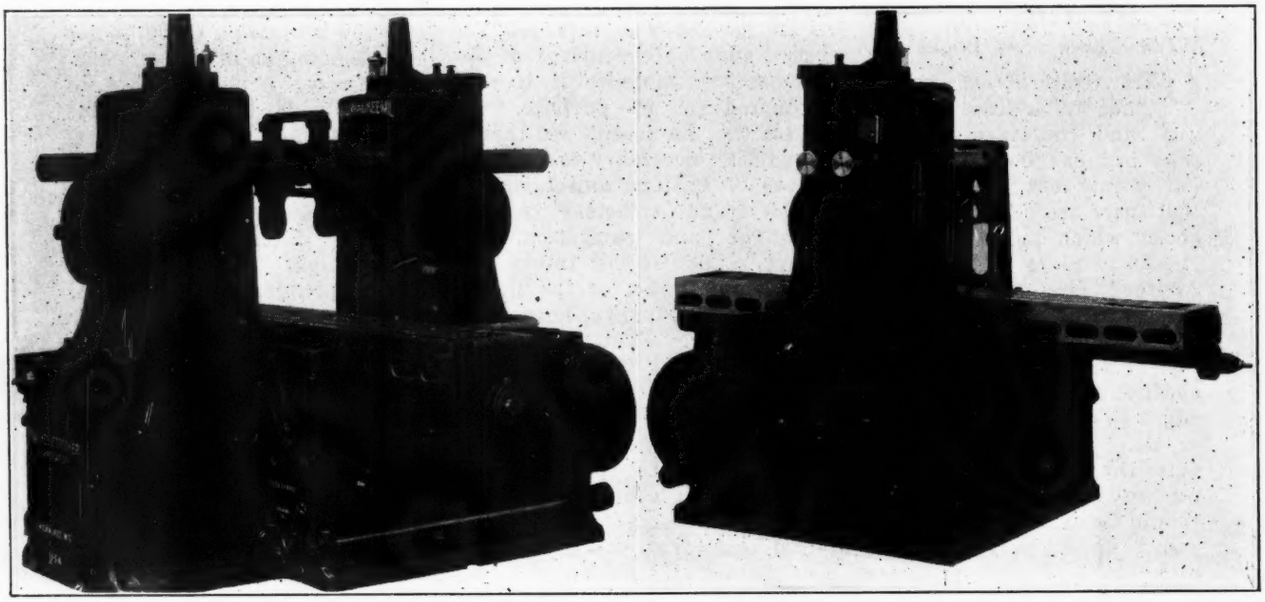
The bed for the Simplex is a heavy box casting about 4 ft. square, with the table ways supported by metal running directly to the foundation. The various units having to do with the feed drive, gear boxes, pumps, etc., are attached interchangeably to the main bed, leaving the top clear to be fitted with standard or special heads, as the operation may require. The bed contains two large reservoirs, one for the automatic pump and lubrication system, and the other for the cutter coolant and centrifugal pump. Cutter coolant channels are provided on the top of the bed, completely surrounding the table, and drain into the reservoir from either side of the machine through large screened openings.

The simplex has 48 in. of power table feed and the table ways in the bed are 42 in. long. The table is of such length that it can never run in on the bed. It is only 32 in. from the floor, which reduces fatigue of the operator and makes the machine fit well into the "production line" where there is a conveyor system. The work table is 5¾ in. thick, measured from the ways of the bed to the top, which makes it very stiff. Several oval-shaped holes are cored through it from side to side, which decrease the weight and carry away the cutter coolant and chips.

A solid semi-steel block, carrying the spindle and double overarms, has 12½ in. of vertical adjustment between the walls of two heavy uprights or double housings. The drive to the spindle is through spiral bevel gears. At the back end the spindle carries a flywheel with guard. The double housing is bolted down to the bed. Spindle block and housing have a total cross adjustment of 8 in. This adjustment is accomplished by means of a screw at the rear of the bed, with a micrometer dial.

The spindle center can be adjusted vertically from 3 in. to 15½ in. over the top of the table, by means of a screw with micrometer dial, located at the upper left side of the double housing. Kearney & Trecker double over-arms are utilized in the new design. They are connected by broad triangular arbor supports. Two arbor supports with adjustable bronze bushings are generally furnished with every Simplex machine. They take arbors up to 2 in. diameter.

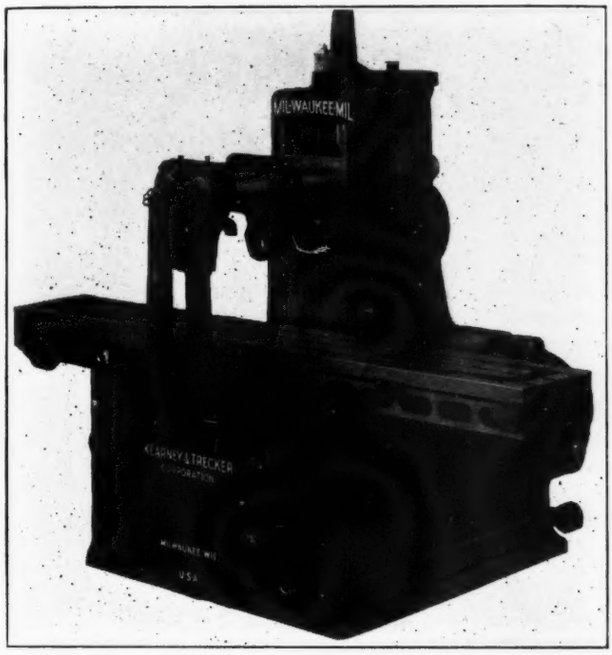
In the plain listed form of both the Simplex and the Duplex there is a box for pick-off gears at the top of the double housing. There is a selection of four different ranges of speeds, 15 to 150 r.p.m., 20 to 200 r.p.m., 30 to 300 r.p.m., or 50 to 500 r.p.m. Each one of these ranges provides 12 speeds, secured with six pairs of



Duplex Mil-waukee-Mil

Rear view of Simplex Mil-waukee-Mil

Parts, Accessories and Production Tools



Front view of Simplex Mil-waukee-Mil

pick-off gears or twelve gears in all, having a 10 to 1 ratio in geometrical progression. A bracket bolted to the right front of the bed, with a hinged cover, provides a housing for the pick-off gears for the table feed.

There is a selection of two feed ranges, either ½ to 20 in. per minute, or 1 to 40 in. per minute. Each one of these ranges provides 18 feeds, secured with various combinations of 9 pick-off gears in geometrical progression.

There are three control levers on the plain Simplex machine, located in a convenient position at the right front of the bed. The upper one of the two short vertical levers is for controlling the power table feed. The lower lever controls the power rapid traverse. This operates at the extremely fast rate of 240 in. per minute in either direction.

There are trip dogs on the front edge of the table for tripping out the power feed at either end of the stroke. A third dog can be located so as to trip out the power rapid traverse when approaching the work.

The long lever at the right of the bed is for starting or stopping the main spindle. The lower end of this lever is attached to the horizontal shaft running to the rear of the bed, which is counter-balanced and engages a multiple disk friction clutch running in oil.

Owing to the fact that the entire spindle drive is mounted on anti-friction bearings and to the great inertia of the spindle with its drive gear and flywheel, a powerful brake is required, and a new style of multiple disk-in-oil brake was adopted, in place of the conventional small cone brake. The rapid traverse may be used for returning the table or running the work up to the cutter while the spindle is standing idle.

The Mil-waukee-Mil is automatically lubricated from one central filling station at the front of the bed by means of a geared pump. There is a glass covered oil flow indicator on top of the double housing. The machine is designed for interchangeable belt or motor drive. A 15 hp. electric motor is mounted in a compartment within the bed. The power is carried from the motor by a 5 in. belt to a 16 in. pulley running at 600 r.p.m. A weighted idler tensions the belt. The driving pulley for the motor-equipped machine has fan-shaped spokes and the housing has louvers cast in it, so circulation of air through the motor is assured.

When arranged for belt drive, the pulley is 16 in. in diameter, takes a 4 in. belt and runs at 600 r.p.m. This pulley is interchangeable with the 5 in. faced pulley with fan-shaped spokes used for the motor drive.

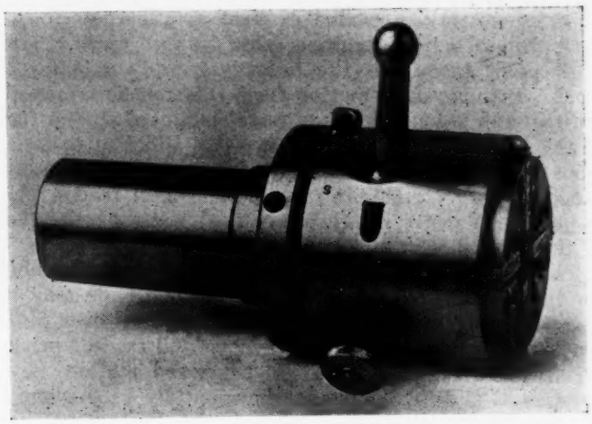
Except for the bed, the Duplex is identical with the Simplex. The bed of the Duplex is extended beyond the table ways to carry the second or left hand head. (What is termed the right side of the Simplex becomes the front side of the Duplex).

The foregoing description applies only to the constructional features of the plain Simplex and plain Duplex Mil-waukee-Mils. To these plain machines in their simplest form, there can be added the following interchangeable units that will make these machines either more productive or adaptable in their operation: (1) Complete sets of pick-off speed gears; (2) Complete sets of pick-off feed gears; (3) Quick change speed gear box; (4) Quick change feed gear box; (5) Automatic feed control; (6) Automatic spindle start and stop control; (7) Spindle reverse; (8) Centrifugal pump and coolant system; (9) Motor-in-bed.

Geometric Die Head

THE Geometric Tool Co., New Haven, Conn., has developed a new line of stationary, self-opening die heads for use on hand screw machines, turret lathes and similar equipment. This new line, designated as Style KH, takes the same type of chaser as former models, Style K and KD, thus affording chaser interchangeability covering a complete line of tools.

The only screws in the new tool are those in the front plates and these need not be removed even when disassembling the die head. The die head is opened and closed axially, the opening action being accelerated by two straight springs in the skeleton. The locking



Geometric Tool Company's new Style KD die head

mechanism consists of a pawl having a broad contact surface. The chasers are removed easily by pulling up the spring stop plunger when the head is in open position and withdrawing the chaser with the fingers. A fraction of a turn on the adjusting ring on the back of the head sets the size which is locked by a spring pin.

The chasers are heavily backed up directly behind the cutting point by a closing sleeve and they are also supported on both sides and bottom with a supplementary support along the top of the front plates.

The Style KH is built in five sizes with a cutting range for straight threads from ⅛ to 3½ in., and for Briggs standard pipe thread from ⅛ to 3 in.

Contin-U-Matic Center Lathe

AMONG the new machines at the National Machine Tool Builders' Exhibition in Cleveland next week will be the Contin-U-Matic center lathe just announced by the Bullard Machine Tool Co. of Bridgeport, Conn. This is an automatic multiple-spindle production machine of the continuous unit type for the machining of work held between centers in a vertical position.

The basic principle of the machine is similar to that of the six-spindle Contin-U-Matic chucking machine with six work spindles in a carrier and six tool heads mounted upon a hexagonal tool column built integral with the carrier, the respective spindles and tool heads always remaining in direct relation to each other and forming six individual units which in operation are rotated slowly around the central column. One complete cycle is required for the chucking, the machining and unloading of a single piece but six units operating simultaneously produce six pieces during the cycle time.

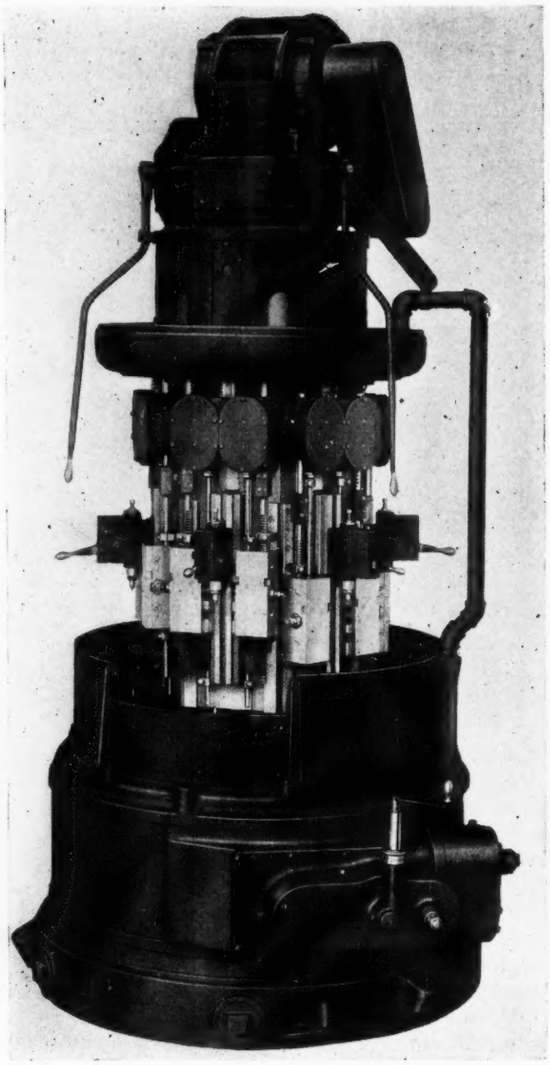
In the Contin-U-Matic center lathe a tail stock with center is mounted on the upper portion of the tool support column and may be raised or lowered to suit the length of the work. The maximum capacity is approximately 20 in. on the standard machine but may be increased when the occasion requires by an extended height of the tool support column and other parts, where these special features are justified.

Spindle speeds available include a complete range up to 300 r.p.m. and are obtained by change gears in the drive bracket. Any one set speed is common to all spindles.

In diameter of work the machine has a maximum capacity of 9¼ in. swing under the tool slides and 5¼ in. diameter clearance between tool slides.

All tool heads are actuated by a vertical motion from the common cam mounted at the head of the machine, which provides for a rapid advance of the heads to the point of cutting, a period of feed at a predetermined set rate and a rapid return with a short dwell at the high point to permit the unloading and chucking of work. Primary feed motion from this cam is transmitted through secondary speed boxes mounted on the face of the tool support column to two tool slides at opposite sides of the center, which are independent in action and independently variable in rate and length of feed stroke, by means of gears in secondary feed boxes on the face of the column.

The tool slide traverse assures exceptional adaptability in vertical and horizontal cuts. Each slide may be independently set for either a plain vertical or a plain horizontal stroke with rapid advance and feed of predetermined rate and length. In combined motion, however, each slide will advance horizontally to the work, traverse vertically along the cut, withdraw from the work at the bottom of the stroke and return in rapid motion to its original position.



Contin-U-Matic center lathe

The maximum length of the plain vertical stroke is somewhat over 9 in. and the maximum horizontal stroke is 1¾ in. In combined horizontal and vertical traverse the compounding requires 3.66 in. of vertical rod motion per in. of horizontal traverse. By deducting the amount of vertical motion necessary for the horizontal traverse required, the balance of the 9 in. stroke is available for direct vertical feed of the slide. The slower horizontal tool feed is of advantage when the tool is nosing its depth into the work, but vertical feed along the cut is taken at the standard set rate.

This arrangement of tool slides in each head provides for a considerable variety of independent tool application grouped in each unit and the two independent slides of each head will therefore accommodate an extensive variety of grouped operations performed simultaneously.

When necessary for the special holding of work, a power-mechanism can be provided with the machine for actuating chuck or special work holding fixtures. A unique design of tail stock operated with one motion of the hand lever facilitates the holding of the ordinary run of work between centers.

The machine operates similarly to the Contin-U-Matic chucking model in that the cycle is divided into two sec-

tors. The loading sector is occupied by the rapid return high dwell and rapid advance of the tool heads, during which time the spindle is not in revolution and the finished piece may be unloaded and the rough piece chucked. The machining sector occupies the greater part of the cycle during which part the work spindles revolve and the cutting operations are in process. The cycle time for various classes of work can be varied from one minute up to fifteen minutes, as required and rates of tool feed may be set within a considerable range and directly applicable to the job. Independent tooling on the six individual units which comprise the machine make it possible to vary the operation and even the nature of the work in process, running a variety of jobs at the same time, provided only that the common features of spindle speed and primary tool head traverse are adaptable to all operations as a class.

In operation the machine can be completely controlled from one position, while main drive clutch levers are provided at three different points about the cycle. Control of carrier motion is through a lever located to the right of the loading sector, and this lever, through an independent clutch and back shaft, engages power for either forward or reverse movement of the carrier. Provision is also made for hand movement when necessary.

Lubrication is by constant flow to all operating parts within the machine and pressure lubrication to external units. At several points throughout the construction devices for protection of the mechanism against overstrain or carelessness have been incorporated in each unit as well as at central points. There are no unexposed rapidly moving parts, which would be a source of danger to the operator.

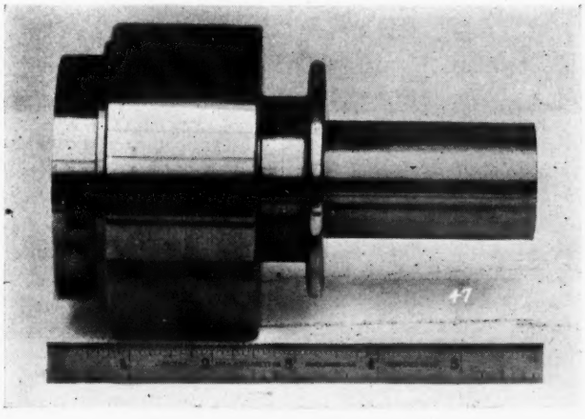
A cutting compound circulating system is provided. Power requirements of the machine range from 10 to 20 hp. and facilities are provided for motor drive with sprocket and chain connections to the main drive shaft. A constant speed motor running at 1200 r.p.m. on either a-c. or d-c. circuits may be used.

New H. & G. Die Head

A NEW design of H & G die head is announced by the Eastern Machine Screw Corp., New Haven, Conn. It is known as Style EE and is designed for use on rotating die spindles.

The head is both opened and closed by means of one yoke which engages the spool or groove in the rear of the head. This new head has a smaller outside diameter and improved locking and tripping mechanism and is also of light weight. It is claimed to provide very accurate adjustment for length of thread cut and because one yoke opens and closes the head its installation on automatic screw machines and such is very much simplified.

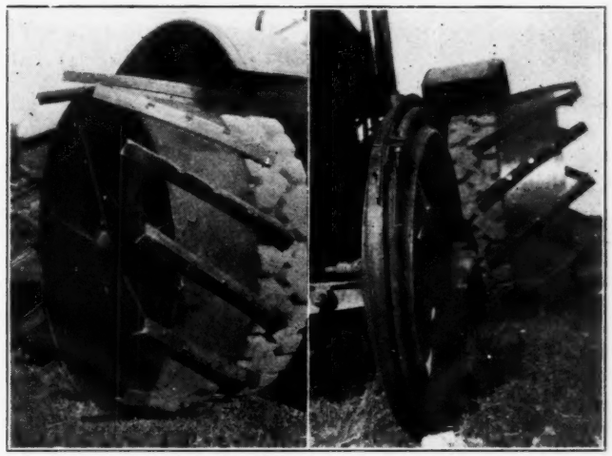
The new head uses the same basic principle of holding the chasers, supporting them directly over the chamfer, and has the same positive opening action as in other H & G die heads. The new head takes the same chasers as used in any of the other styles of heads made by this manufacturer. It is available in the following sizes: 7/16-in size with outside diameter 2⅜ in.; 9/16-in size with outside diameter 2⅞ in.; 1-in. size with outside diameter 3 15/16 in.; 1¼-in. size with outside diameter 4⅝ in.



New H & G die head

Tractor Wheel Equipment

AS equipment for industrial and farm tractors which operate on surfaces where traction is difficult to obtain, French & Hecht, Davenport, Ia., have developed two devices designed to aid in this work. They are a steel extension wheel equipped with angle iron cleats that extend partly over the rubber tire of the tractor and an angle iron band designed to pass entirely around the front wheels of tractors to prevent their slipping and to make steering traction better.



Left—Tractor equipped with French & Hecht steel extension wheel. Right—Front wheel of tractor fitted with French & Hecht steering band

The extension wheels are of the same diameter as the outer diameter of the tractor tire. They are attached to the regular wheels in the same way as rubber tired extension wheels are attached, by means of lugs through which bolts pass to hold the rims rigidly together.

The cleats are made of angle iron and are bolted to the extension wheel in such a manner that they extend partly over the rubber tire.

The steering band consists of steel angle irons which pass entirely around the front wheels over the rubber tire and can be drawn up tight by a draw bolt. One leg of the angle rests against the tire and the other extends outward, affording a deterrent to the wheels slipping sideways under heavy pulls.

THE article describing the new Chrysler 72, in our issue of Aug. 20, stated that the equipment included a coincidental "steering and ignition lock." The lock, according to the Mitchell Specialty Co., does not affect the steering apparatus, but is an Electrolock which secures the ignition only, although in this case it is mounted on the steering column bracket.

THE FORUM

Believes *High-Speed Diesel* Problem *is* Nearing Solution

Developments in Europe are cited to show that considerable progress has been made in regard to speeding up combustion.

Editor, AUTOMOTIVE INDUSTRIES:

In your issue of Aug. 20 you print a letter from Robertson Matthews on Vaporization in Compression-Ignition Engines. Mr. Matthews takes issue with me on certain points raised in a letter of mine printed in the July 23 number of your journal.

In answering him I can probably do nothing better than to subjoin a somewhat lengthy list of articles having a more or less direct bearing on the question he raises. In so doing I must apologize for the fact that my literary connections compel me to keep my attention focused more on developments on the European continent than in the English-speaking countries.

I know that intensive work is being done on the Diesel engine in this country now, and everybody knows that solid injection was developed largely in England. It is, however, in Germany that the most systematic and scientific development of the high-speed Diesel has been brought to the attention of the public. I think any impartial observer who studies this development will have to admit that it is not of the "filing and whittling" character which Mr. Matthews refers to, but has been a steady, purposeful, many-sided advance in which mechanical invention and scientific scrutiny have played equal parts.

I believe Mr. Heldt in *Automotive Industries* has taken pains to familiarize American readers with some of this work, and some of my references below pertain to articles of his.

Mr. Matthews somewhat ironically asks me to determine the speed of the molecules in a Diesel engine and the speed of conversion of a liquid globule into gas. I believe the fundamental principles of the injection process were attacked long ago theoretically by Hesselmann, with very clarifying results, and that there have since been published a number of experimental researches bearing him out and contributing further clarifying details. Professor Neumann in a recent lecture before the German Society of Engineers on the basis of experiments on the Dorner engine (see *Der Motorwagen,* Aug. 10, this year) states definitely that in his opinion the speed of the injection and combustion process is no longer the limiting feature of the high-speed Diesel, but rather the possibility of introducing sufficient air. The time element necessary for the evaporation of a globule of liquid has also been investigated and the results will be found in the files of *Der Motorwagen,* if my memory bears me out correctly.

Mr. Matthews states that "as far as he is aware there isn't even an experimental compression-ignition engine giving the b.m.e.p. possible with a carburetor engine at 1400 r.p.m. and showing a fuel consumption below 0.6 lb. per b.hp. hour." The Dorner engine is stated to give a mean effective pressure of 100 lb. per sq. in. at 976 r.p.m. It shows a fuel consumption of about 0.46 lb. per hp. hr. at 1091 r.p.m. and this fuel consumption increases only negligibly between 887 r.p.m and 1091 r.p.m.

These pressures and fuel consumptions are not very different from those of the MAN and the Benz Diesels, and engines of the MAN type are now in successful experimental operation on trucks in Germany. As for speed, I know that the Maybach Diesel operates at 1300 r.p.m., that the Frey Diesel is stated to operate regularly at speeds much in excess of this, 2500 r.p.m. with 4000 r.p.m. maximum idling speed, if I remember correctly, and that the small Hvid engine described by Mr. Blakely on Page 864 of the Transactions of the American Society of Mechanical Engineers of 1919 was said to perform satisfactorily at 1500 r.p.m.

I regret, of course, that I am merely an onlooker and a theoretician in this field. I have to trust the printed page. If all these German professors and chief engineers distort their figures and publish misleading statements, then, of course, I am hopelessly wrong. Perhaps they do in some cases. I do not think they do in all. Professor Stribeck, whose eminent standing in the world of engineering nobody will deny, believes that the Acro engine, described by Mr. Heldt in a recent number of *Automotive Industries,* presents a complete solution of the speed problem in Diesel combustion. Some of his conclusions have been challenged. Let us hope that they will be checked up at the earliest opportunity.

In conclusion let me say this: We in America are both helped and hampered by our large financial resources. We can throw tremendous means to certain

problems, and to certain men, in which large financial groups happen to be interested. We can just as effectively block the solution of other problems. On the whole the Diesel problem has been one of the blocked ones. The Diesel engine may now *barely* be stealing into the automotive field by way of shipping, Diesel locomotives and perhaps aircraft. The big automotive producers are not yet interested. When resources are forthcoming we can solve the Diesel problem just as well as any other problem.

The Bugatti racing engines in Europe are now running over 7000 r.p.m. Would we have thought such a thing possible when we regarded 1/50 second as the lower limit in which the combustion process could possibly be performed? The Diesel engine is already doing marvels and has attained speeds that a short time ago seemed unbelievable for this type of machine. If Mr. Matthews would wish to see how further progress can be made perhaps I might be allowed to recommend for his reading the article by a Hindoo engineer, Dr. Jatindra Nath Basu, beginning in *Der Motorwagen* of May 10. Dr. Nath Basu studies, in true Indian slow and painstaking fashion, how to shape Diesel engine cams so as to secure desired results. After he has finished his studies he designs his cams—and they work. I believe a little bit more slow and painstaking Oriental philosophy would not hurt our engineering.

My list of references follows: *Der Motorwagen*, Oct. 10 and 31, 1925; Feb. 10, June 30, Sept. 20, Sept. 30, Aug. 31, Nov. 10, Dec. 20, Dec. 31, 1926; Jan. 10, Aug. 10, May 10, 1927; VDI, *Zeitschrift des Vereines deutscher Ingenieure*, May 31, Oct. 7 and 11, Nov. 1, 1924; May 9, Aug. 29, Oct. 31, 1925; July 31, Aug. 7, Oct. 30, 1926; May 28, 1927; *Le Genie Civil*, June 20, 1925; *Wirtschaftsmotor-Nutzmotor*, April 25, May 25, 1925; *Commercial Motor* (England), July 5, 1927; *Motor Transport* (England), July 11, 1927; *L'Auto Italiana*, Jan. 31, 1927; *Automotive Industries*, Feb. 12, March 12, June 18, 1927.

C. A. NORMAN,
Ohio Sate University,
Columbus, Ohio.

Diesel Engine Efficiency

Editor, AUTOMOTIVE INDUSTRIES:

In your issue of July 23, on page 131, you publish a very interesting discussion on combustion efficiency of high-speed Diesel engines by Prof. C. A. Norman, Ohio State University.

When reading this discussion, it struck me that a few more facts concerning the fuel consumption of low and high-speed Diesels would tell something about recent developments of the Diesel engine, especially the airless injection type.

Looking up the file, I found records of several of the latest Diesels, but apparently the tests were made on the test beds of the factory. However, as the figures given show an unusual regularity, it may be taken for granted that they are reliable as a comparison, obtained as they are in different factories of different countries, usually by a professor of reputation in each country.

As recently as 1920 it was regarded as a satisfactory result if a large air-injection Diesel engine had a fuel consumption of about 0.400 lb. p. b.hp.-hr., and occasionally there was a report of as low a consumption as 0.390 lb. p. b.hp.-hr. More recently, results of tests of several large airless-injection engines have been published, that is, slow running engines of 400-500 hp. in four-cylinders.

For instance, there is the Hesselman Diesel engine now being built by the A. E. G. in Berlin. A test by Prof. Hubendick in Stockholm, on one 400 hp. four-cylinder, four-stroke-cycle engine running at 210 r.p.m. with airless injection showed a consumption of 0.372 lb. p. b.hp.-hr.

In England a Doxford engine, which is very large and of the opposed piston two-stroke-cycle type, was found to have a consumption of 0.368 lb. p. b.hp.-hr.

In Germany a single-acting, four-stroke-cycle MAN engine of 400 hp. in four-cylinders was found to have a consumption of 0.369 lb.

A single acting four-stroke-cycle Krupp engine of 520 hp. in four cylinders was found to have a consumption of 0.374 lb. p. b.hp.-hr. (See *Power*, Vol. 65.)

Of the high-speed type there are two outstanding engines, one a really small one, the second of medium size.

The Junkers Engine

First of all I want to mention the Junkers engine (see V. I., Vol. 71, No. 13). This is an opposed-piston, two-stroke cycle engine of about 3⅛ in. bore and 6 in. stroke for each piston. Running on fuel oil of 32 deg. Be. at 1000 r.p.m., it developed 50 hp. with a fuel consumption of 0.380 lb. p. b.hp.-hr. This corresponds to an m.e.p. of 105 lb. p. sq. in. At the maximum speed of the test, 1500 r.p.m., it consumed around 0.400 lb. p. b.hp.-hr. and showed an m.e.p. of 85 lb. p. sq. in. Its maximum m.e.p. was 122 lb. p. sq. in., at 1000 r.p.m., the piston speed being moderate, 1000 ft. p. m.

The second engine, the Beardmore, described in this magazine and also in *The Automobile Engineer* for April, 1926, was tested in England and developed a higher maximum pressure than usual. During a three hour run at 1000 r.p.m., it developed 424 hp. and was found to have a consumption of 0.365 lb. p. b.hp.hr. The bore and stroke are 8¼ x 12 in., and its maximum test speed was 1400 r.p.m., which means an average piston speed of 2800 ft. p.m. However, the ordinary running speed of this engine is around 750 r.p.m.

It seems that by eliminating the air compressor a gain of 6-7 per cent is secured, provided there is enough suitable turbulence within the combustion chamber.

The lowest consumption on record until recently was the 0.365 lb. p. b.hp.-hr. by the Beardmore engine. By so preparing a standard Beardmore that its mechanical efficiency was increased in the proportion of 1.085 to 1, by cutting the ring friction, its fuel consumption dropped from 0.418 to 0.385 lb. p. b.hp.-hr., besides which the change increased the life of the engine.

By further increasing the maximum pressure (having in mind the very high speed) a consumption of 0.365 lb. p. b.hp.-hr. was recorded. (See *The Automobile Engineer* of April, 1926.)

A recent test on a Deutz six-cylinder 1000 hp. airless injection engine put up a new record in low fuel consumption, of 0.354 lb. p. hp.-hr. of an oil of a 10,000 B.T.U. per lb. standard. For further interesting information see *Engineering* of London of May 13 and 20, 1927. This record was achieved with a maximum gas pressure of 555 lb. p. sq. in. and an oil-injection pressure of 5000 lb. p. sq. in. The mechanical efficiency was 82.9 per cent under the most favorable conditions.

The result obtained with the Beardmore engine points to the fact that a high-speed engine can use high gas pressures. This is particularly the case with two-stroke cycle engines, where the piston inertia force helps to balance out part of the gas pressure and thereby reduces the bearing loads and connecting rod stresses.

Therefore, the higher the speed goes up, the higher can the pressure rise with advantage.

Another point seems to be that the higher the maximum pressure, the better will be the fuel economy, and the engine will run cleaner at high loads. This means that the oil has to be injected into the cylinder in a relatively shorter time than before, say, for instance, during 10 instead of 20-25 deg. crank travel.

But before an engine can be developed into a high-speed and high-pressure engine, a suitable piston ring has to be found. The present type ring would not stand such high speed and high pressure combined. It is shown by the reduction in frictional losses in the Beardmore engine that a ring must be developed that seals against any pressure and that does not wear as quickly as the present type (and consequently does not develop as much friction). Such a ring will stand up longer with hard service that the present ones and would be worth a higher price.

The Ring Question

The ring question is only one of many in the high-speed engine. In a high-speed Diesel engine no trace of smoke can be tolerated in the exhaust. A smoky exhaust would very soon ruin the rings, piston and liners at these high speeds. The lubrication problem also has to be solved. A plunger pump is required that will inject oil perfectly under 5-6000 lb. p. sq. in. pressure at up to 2500 r.p.m. This pump problem is of a mechanical as well as of a hydromechanical nature, but requirements can be perfectly satisfied by a simple design of pump which can be standardized and manufactured as an accessory.

Having solved the mechanical and hydromechanical problems the thermodynamical one still remains. Local concentration of the fuel spray in the combustion air, for instance, is an obstacle to overcome.

The most important requirement in all internal combustion engines is the proper mixture of the fuel with the air. Particularly is this the case in small, high-speed compression-ignition engines where the combustion space volume is of only a few cubic inches. This problem has to be solved individually in each case according to whether the engine works on the four-stroke-cycle or the two-stroke-cycle, and whether it is of the single or double-opposed piston type.

There is such a difference in the natural turbulence of the air during the compression stroke that what is good for one type is not good for another, in the way of fuel spray and shape of combustion chamber.

It may be emphasized, however, that the sprayed fuel must not touch the cool wall, at least not before it is thoroughly vaporized and partly burned. This means that in the direction of the spray there has to be an air space at least 3 in. long, wherein the spray can develop and burn, with the help of the right kind of turbulence. With proper arrangements there seems to be practically no limit to the speed in r.p.m., due to the combustion alone, but obstacles will be found elsewhere.

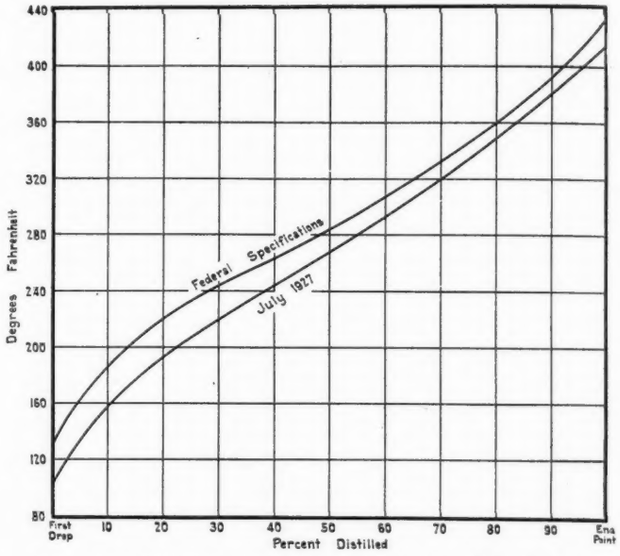
HUGO MOREN.

Semi-Annual Gasoline Survey

THE motor gasoline that is being marketed in the United States this summer is slightly more volatile than that sold a year ago.

During the past eight years the Bureau of Mines has made semi-annual surveys of the gasoline marketed in the United States, the survey just completed being the sixteenth in the series. The cities in which samples have been collected have been chosen as representative of the more important marketing territories as it is obviously impracticable to obtain a sample of every gasoline sold in the entire country.

As compared with the results of the survey held a



Average distillation curve of motor fuels sold in U. S.

year ago the change is only very slight, but a comparison of the results for July, 1927, and July, 1920, shows a decided improvement in respect to volatility. Thus, the initial temperature decreased from 130 to 102 deg., the 20 per cent point from 208 to 193 deg., the 50 per cent point from 268 to 267 deg., the 90 per cent point from 388 to 381 deg. and the end point from 446 to 417 deg.

Until recent years there has been a distinct difference between "summer" and "winter" gasoline, that marketed during the summer being less volatile than that sold during the winter. This summer the difference between "summer" and "winter" gasoline is shown only in the lower end of the distillation range while the upper end is more volatile. This tendency toward uniformity confirms the observation made in the fifteenth survey.

Distillation curves representing the present Federal Specification for United States Motor gasoline and the average of all samples in the present survey are given in Fig. 1. A complete copy of Serial No. 2827, containing detailed tables of the analyses, can be obtained on request from the Bureau of Mines, Washington, D. C.

Information for Exporters

A PRACTICAL topic of direct interest to American exporters is dealt with in a pamphlet, "Foreign Agency Agreements," just issued by the American Foreign Credit Underwriters, Inc., 381 Fourth Avenue, New York City. The pitfalls of doing business abroad through agents are carefully considered in this booklet and sound advice is given how to avoid them. The essentials of a binding and mutually satisfactory agreement are stated clearly, and pointers are given to manufacturers and exporters on the general subject of increasing their sales abroad with the help of reliable foreign resident agents. Our readers who may desire a copy may secure it without cost, while the supply lasts, by addressing the American Foreign Credit Underwriters, Inc.

Many New Machine Tools *Introduced* at *New Haven* Show

Latest production equipment displayed by manufacturer of New England and Middle Atlantic sections. Interest and attendance on par with other years.

By P. M. Heldt

THE New Haven Machine Tool Exhibition, which was held last week for the seventh time at New Haven, Conn., evidently is maintaining its hold on the machine tool industry in spite of the fact that that industry will this year hold an exhibition of its own, which it has not done in the past.

The number of exhibitors was about the same and the show bore the same aspect as in previous years. It is local in character and is patronized mainly by manufacturers in the New England and Central Atlantic districts; where machine tools, etc., made in the more remote parts of the country are shown, the exhibitors are usually the local or district representatives. One naturally would not expect the attendance to be influenced by the new order of things, and this expectation seemed to be justified by the facts. It was noticed that the more prominent exhibitors in most cases occupied the same spaces as in previous years.

The outstanding event in connection with the exhibition was the Thursday evening dinner at the Taft Hotel, sponsored by the New England Council, the Engineering Societies and the New Haven Exhibit Committee. Harry Westcott, chairman of the Exhibit Committee, introduced E. Kent Hubbard of the Manufacturers Association as toastmaster.

Governor Trumbull in the opening address reviewed the early development of industry in New England and pointed out that the competition which New England today faces is that of her own offspring in the broader American industrial development. He made a significant point of suggesting that in individual conferences with governors of the other New England States during the summer, certain projects were taking form that would be placed later before the New England Council and with favorable action should considerably broaden the very practical activities of this body.

Economic Survey

Charles R. Gow, of Boston, presented a very complete economic survey of industrial conditions, drawing conclusions from the effect of general industrial conditions on New England machinery.

C. R. Burt, vice-president and general manager of the Pratt & Whitney Co., Hartford, indulged in a confession of the conditions which existed in his plant several years ago and described the manner in which they obtained complete absolution by sweeping changes in equipment throughout all departments. He pointedly remarked that in reequipping the plant they were particularly careful to choose machine tools of various types from different builders in order that with the actual machinery before them they might have the advantage of knowing exactly the design and performance which other builders of machinery were offering and to analyze its effect on their own line of tools.

Charles L. Newcomb, manager of the Worthington Pump & Machinery plant at Holyoke, Mass., told of the forced improvements in machinery that were brought about by the urge of the customer.

Keller Lathe Attachment

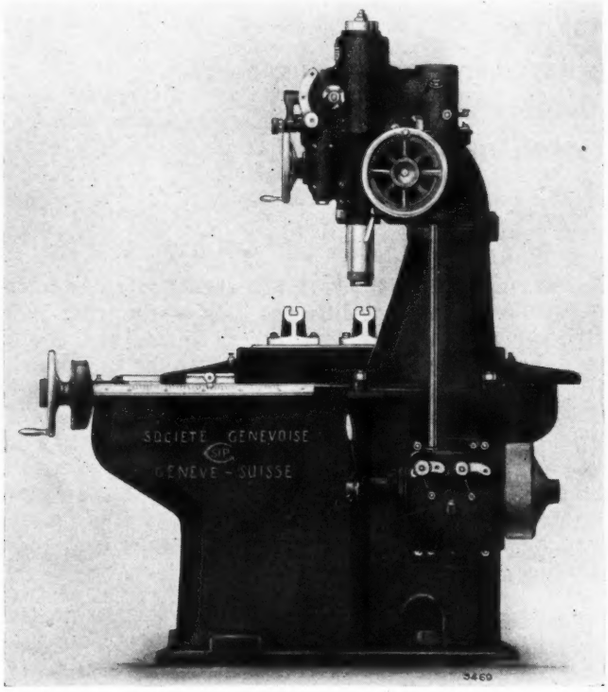
The Keller Mechanical Engineering Corp. of Brooklyn, showed, in addition to its automatic toolroom machine, a lathe attachment for turning solids of revolution from a templet representing a half-section of the solid. At the exhibition the attachment was shown applied to a Prentice lathe. In addition to the means for driving the spindle there are provided two electric motors at the right hand end of the lathe bed, one for the longitudinal feed and the other for the cross feed. These motors are controlled by electric contacts of a control device mounted on the lathe carriage, the contacts being actuated by the templet in conjunction with the motion of the carriage. A control cabinet forms part of the equipment. This contains the switches and meters and stands close to the lathe. Electric cables leading from it to a junction box on the lathe pass through flexible metallic conduit. The firm also showed for the first time the Kellocater, a device for laying out and jig-boring.

The E. W. Bliss Co., Brooklyn, N. Y., showed a new high-speed press operating at 600 strokes per minute. The slide is counterbalanced to minimize vibration. At the exhibition the press was shown arranged for single-row feed, but it can be arranged also for double-row feed, either continuous or intermittent. The company makes a similar press of larger size, operating at 300 strokes per minute. This larger machine, which is now in regular production, is used for stamping out such parts as radiator fin sheets. In the design of these new presses the highest possible degree of rigidity has been aimed at and the bearings have been brought up very close to the pitman, which features are said to greatly increase die life. The larger machine has Bowser force-feed lubrication to every bearing. The company also exhibited its nail and rivet-making machine.

The Eastern Machine Screw Corp., of New Haven,

exhibited its new Style EE H. & G. die head. As compared with the previous style this new design is simpler in construction and can be set more accurately for length of thread. These die heads, of course, are used with automatic multiple spindle machines.

The Monarch Machine Tool Co., of Sidney, Ohio, had a joint exhibit with the SKF Ball Bearing Co. Of the Monarch company's products, a 20-in. lathe with all-ball-bearing head was shown. This size of lathe is made with ball bearings on the spindle this year for the first time. The SKF exhibit consisted of a large line of ball and roller bearings suitable for use in machine tools.



Societe Genevoise No. 3 jig-drilling machine

Potter & Johnston, of Pawtucket, R. I., showed one of their Power-Flex 5-D automatic chucking and turning machines in operation on a three-roll drive gear blank, doing the first operation on the blank.

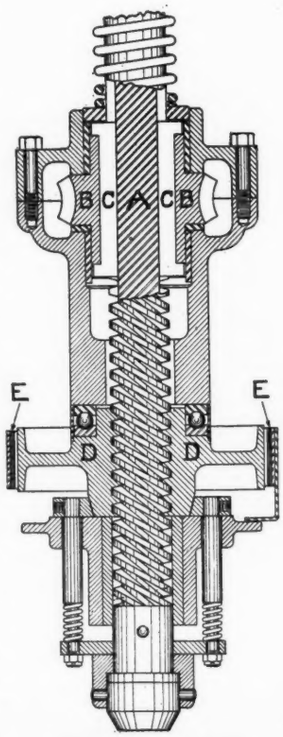
Pneumatic Drop Hammer Co., of Boston, Mass., showed two drop hammers of different sizes. These hammers are lifted pneumatically and then drop from a given height by gravity. The height of drop remains constant but the force of the blow can be varied and accurately gaged by throttling the exhaust from the pneumatic cylinder more or less.

The O. K. Tool Co., of Shelton, Conn., showed a variety of its boring and facing tools. These tools have inserted cutters with serrated backs, which feature permits of the cutters being restored to their original diameter after the latter has been reduced by wear, by removing each blade and placing it in the next position in the holder. When all of the blades have been advanced radially by a definite increment, the tool may be reground to size. This principle of restoring the tool to size by change in position of the cutter blades is applied to multiple boring tools, hollow mills, facing heads, and boring heads.

Triplex Machine Tool Co. of New York, selling agents, exhibited a considerable variety of machine tools, including some important ones. Among these was the Societe Genevoise jig boring machine made in Geneva, Switzerland. This machine, which is imported by the R. Y. Ferner Co., of Washington, D. C., is now being made in a new size, No. 3, midway between Nos. 2 and 4. This new machine, herewith illustrated, is similar to the larger machine in design, having a table moving on ways on the bed of the machine with uprights on each side of the table, which are connected by a cross rail. The boring head is mounted on a slide which moves on this cross rail. This cross rail, however, differs from that of the larger machine in that it it not raised and lowered, but rigidly connects the uprights. This construction materially reduces the cost of this machine, but, by reason of the other features of the design, the adaptability to different classes of work is not materially changed.

Flexible Power Press

Another machine shown on the Triplex stand was the Flexible Power Press manufactured by the General Mfg. Co., Detroit, Mich. This press is used in production work, as, for instance, the bending at right angles of the ball ends of steering arms. These arms are drop forged straight and the lower end, including the ball, is then bent at right angles in the press. The machine is power-driven semi-automatic in operation and has a capacity of 8 tons. In addition to straightening and bending operations it is adaptable to pressing in bushings, assembling gears to shafts, etc. By means of a special mechanism the pressure applied by the press can be accurately limited. This mechanism is illustrated herewith. The ram A is driven at constant speed in one direction by the worm wheel B and spline keys C, the nut D revolving with it until pressure is applied to the pedal, which tightens the brake band E on the nut D. Then the ram advances through the nut D until the pressure on the pedal is released, at which time a suitable spring returns the ram quickly to the normal position, the nut spiraling on the thread. A stop is provided to prevent overtravel of the ram.



Mechanism of flexible power press

The Triplex company also showed a gear hobber and a hob grinder manufactured by Hermann Pfauter, of Chemnitz, Germany.

The Bullard Machine Tool Co., of Bridgeport, Conn., exhibited one 6-in. Mult-Au-Matic and a Mult-Au-Matic unit, a single spindle supplementary-operation machine. This company has brought out a Contin-U-Matic center lathe which will be first exhibited to the public at the Cleveland Machine Tool Builders' Exhibition.

Pratt & Whitney Co., of Hartford, Conn., Exhibited only small tools and gages, together with the new type of super-micrometer recently announced. The Hoke precision gage blocks were shown.

Buffalo Forge Co., of Buffalo, N. Y., exhibit, among other tools more particularly suited to the jobbing shop, a new high-speed 12-in. drill running at up to 10,000 r.p.m. This high speed is made possible by the use of ball bearings (SKF) in the head. It is fitted with a ½-hp. motor and at the speed mentioned can handle a 5/16-in. drill, while at lower speeds a ⅜-in. drill can be used.

Racine Tool & Machine Co., Racine, Wis., exhibited its "Shear-Cut" production saw for high speed metal cutting. It is of the hacksaw type, using a high speed steel blade which is positively fed into the work. The feed is adjusted to correspond to the size of stock to be cut. It is claimed that the tooth load is uniformly distributed throughout the cutting stroke and all of the teeth enter into the cutting action. In the ordinary hacksaw the cutting time increases materially as the blades become dull, while with this saw, owing to the positive feed, the cutting time remains constant. It is claimed that a bar of 3-in. cold-rolled steel can be cut in four minutes and a 6-in. bar of cold-rolled steel in 13 minutes.

The Goss & De Leeuw Machine Co., of New Britain, Conn., exhibited their 6 by 6¾ in. automatic chucking machine which has been on the market for some years. Recently the bed of this machine has been made more rigid and provided with a chute for chips. A new 11 by 10 in. automatic machine of similar type has been developed, of which a description will appear in these columns shortly.

Jones & Lamson Machine Co., of Springfield, Vt., exhibited samples of various lines, including a Jones & Lamson flat turret 15-in. chucking machine operating on a steel wheel for an automatic chuck; high-speed series dies and ground and lapped-in thread chasers, and the Hartness screw thread comparator.

The New Britain Machine Co., New Britain, Conn., showed its 1-in. six-spindle automatic screw machine in operation on a typical six-spindle screw machine job. This job was selected to show the advantages of splitting up tooling positions on a multiple spindle screw machine. The No. 23-A automatic chucking machine was shown in operation on a brass globe valve bonnet, on which a production of 261 per hour was claimed, the operations including drilling, boring, facing, tapping and threading. A No. 454 New-Matic chucking machine was shown in operation on a differential side gear job.

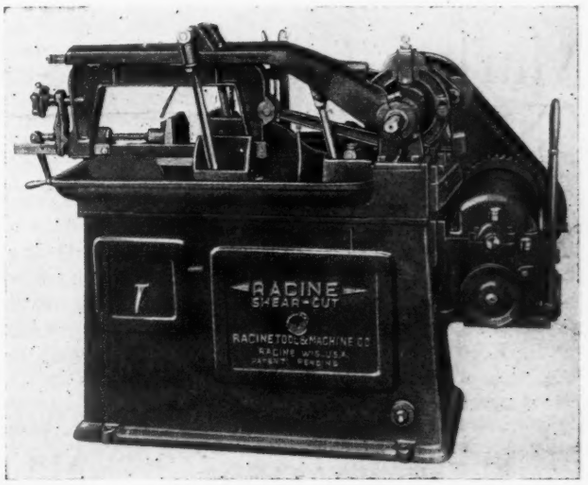
The National Acme Co., of Cleveland, Ohio, featured its new Gridley multiple spindle automatic screw machine, which has four work spindles of 1⅜-in. bar capacity. This machine employs ball bearings throughout. There was also shown a five-spindle Acme automatic of 9/16-in. bar capacity. The exhibit was completed by a collection of Namco opening dies, collapsing taps and screw machine products.

Arc Welding Exhibit

The General Electric Co. had an exhibit which featured the new automatic hydrogen arc welding equipment and also comprised electric motors and motor control and starting equipment.

Bausch & Lomb Optical Co., of Rochester, N. Y., showed several optical devices for machine shop use, including the Contour-Measuring Projector and the new toolmakers' microscope, the AKW-4 microscope, Brinell microscopes and metallographic and photomicrographic equipment.

Divine Brothers Co., of Utica, N. Y., exhibited a polishing machine made in units for the polishing of flat articles. The parts to be polished are placed on a belt conveyor and are moved beneath the polishing wheels. In addition to this machine the company showed samples of its polishing wheels, including



Racine shear-cut power saw

compressed leather, compressed canvas, muslin, solid canvas, solid felt and other types. The company also showed samples of its canvas cushion wheels which are widely used on industrial trucks. The layers of canvas in the rims of these wheels are radial with respect to the wheel axis and the threads run at angles of 45 deg. to the wheel axis.

The exhibits on the third floor consisted chiefly of lighter items of machine shop equipment and of machine tool parts. There were installed in this room several manufacturers of anti-friction bearings, including the Fafnir Bearing Co., the New Departure Mfg. Co. and the Timken Roller Bearing Co. The Van Dorn Electric Tool Co. showed samples of its various electric tools, including a drill, polishing wheel, grinder, screw driver and tapping machine, as well as an electric glue pot. The Bristol Co., of Waterbury, Conn., showed its safety set screws and metallic belt fasteners.

Rowing Against the Tide

WHOEVER has had the experience of rowing against the tide will bear witness to the discouraging character of the operation. It may be possible to make headway if the tide be not too swift, but the energy expended is out of all proportion to the ground gained. Furthermore, if you row against the current, you must keep everlastingly at it. If you stop to rest for a minute you are carried backward, says a recent United Business Service bulletin.

It is like that when a business man or firm tries to buck the tide of public preference.

It is vastly easier to row with the tide than against it, even though by dint of persistent effort you are able to make gains. Adapting your goods, your service, your appeal to the popular demand spells profit. In business the public must be the judge of what it wants. It is indeed possible—and profitable—to create new desires by advertising, but not to turn back the current of fashion. Style, fashion, the popular desire—these are hard currents to pull against under any condition.

AUTOMOTIVE NEWS SECTION INDUSTRIES
Philadelphia, Pennsylvania Saturday, September 17, 1927

Market Conditions Favor Normal September Output

PHILADELPHIA, Sept. 17—September gives every evidence of being a normal month for a majority of the automobile producing companies. The August production total of about 310,000 cars and trucks is not likely to be equalled this month, but the recession will not be drastic. The hesitancy on the part of buyers that has kept the output total of the industry below the 1926 level has not been overcome and as the time for the Ford announcement draws near there may be further slackening.

Active production by Ford will settle a moot question—whether the automobile market this year has been intrinsically a poor one as compared with 1926 and 1925, or whether a substantial number of prospective buyers have merely deferred their purchases. The more optimistic view is generally taken in the industry.

Dealers' stocks of new cars in some lines have had a tendency to accumulate in recent weeks and this accounts for somewhat lower production schedules in some instances. On the other hand several factories have just brought out new lines and this gives the opportunity for heavy output for several weeks for these companies. On the whole, however, the trend is downward, as would normally be the case at this season.

The used car situation is spotty, with stocks in good condition in some territories and excessive in others. The Windsor used car plan which is designed to stabilize trade-in allowances on a basis fair to the dealer apparently has been working very well in some of the many cities that have introduced it this year.

Industry Not to Suffer by Franco-German Treaty

WASHINGTON, Sept. 15—The United States automotive industry in its export business to France and Germany, will not be materially affected by the new Franco-German commercial treaty which became effective Sept. 1, according to cable advices to the tariff division of the Department of Commerce.

The net result of the tariff treaty between the two countries, however, will be materially felt by other domestic industries, principally electrical equipment, heavy machinery, hardware and specialty products, the duties being four times as high towards this country as between France and Germany's exports and imports.

Tractors, engines, motors, radiators and vehicles imported from the United States, will continue to receive minimum rates of duty in the new schedules, the department is advised.

G.M. August Sales Mount to 158,619

NEW YORK, Sept. 14—General Motors Corp. retail and wholesale sales of cars and trucks set a new record for August. Dealers' sales to consumers were 158,619 cars against 134,749 in July, and 122,305 in August last year. Sales by car divisions to dealers in August were 155,604 against 136,909 in July and 134,231 in August, 1926.

Comparisons follow:

	Sales to Users		Sales to Dealers	
	1927	1926	1927	1926
Jan. ...	81,010	53,698	99,367	76,332
Feb. ...	102,025	64,971	124,426	91,313
Mar. ...	146,275	106,051	161,910	113,341
Apr. ...	180,106	136,643	169,067	122,742
May ...	171,364	141,651	173,182	120,979
June ...	159,701	117,176	155,525	111,380
July ...	134,749	101,576	136,909	87,643
Aug. ...	158,619	122,305	155,604	134,231
Totals ..	1,133,849	844,071	1,175,990	857,961

Bus Electric Standards Discussed at Convention

SHAWNEE-ON DELAWARE, PA., Sept. 15—Standards for motor bus electrical systems and the development of the membership and activities of the field division, were the major topics discussed during the three-day convention of the Automotive Electric Association which closed here today.

Graham Offers New Buses

DETROIT, Sept. 15—A line of six-cylinder buses has been introduced by the Graham Brothers division of Dodge Brothers, Inc., to supersede the four-cylinder units formerly marketed. Lockheed hydraulic four-wheel brakes, four-speed transmission and a new design three-stage rear spring are fea- passenger parlor coach; $4,060 for the 21-passenger street car and $4,290 for the 16-passenger parlor coach.

Indian to Make Shock Absorber

SPRINGFIELD, MASS., Sept. 15—Indian Motorcycle Co. has started production of an Inertia shock absorber.

Ford Said Buying Para Rubber Land

NEW YORK, Sept. 15—Further indication of the plans of Ford Motor Co. for the manufacture of its own tires and rubber products, is seen in the reported purchase by the company of 1,200,000 acres of rubber land in Para, Brazil. An additional 2,800,000 acres will be bought if the company is successful in closing contracts with Para officials.

The company would place 50,000 laborers in Tapajez and would build a railroad across Para as part of its development, the project to get under way within two months. Complete facilities for handling rubber would be installed and the product would be brought to the United States in Ford ships as return cargoes following deliveries of cars and parts at South American ports.

Relay Motors to Move Offices to Lima Plant

WABASH, IND., Sept. 15—Headquarters of Relay Motors Corp. will be moved to the Garford plant of the company at Lima, Ohio, following the recent purchase, but manufacture of the Commerce, Garford, Service and Relay lines will be continued at both the Wabash and Lima plants.

Officers of Relay Motors Corp. now are G. L. Gillam, president; W. E. Conway, vice-president; A. K. Taber, vice-president and secretary; J. M. Farr and H. Happersberg, vice-presidents, and I. A. Stull, treasurer. Department executives for the combined companies are W. J. Baumgartner, chief engineer; D. F. Domizi, consulting engineer; F. M. Kincaid, axle engineer; O. M. Binkley, factory manager; H. E. Burke, purchasing agent; W. E. Conway, vice-president in charge of sales; H. W. Fenton, assistant sales manager; F. A. Smith, export manager; F. E. Borer, advertising manager; A. D. Turner, service manager, and J. A. Miller, traffic manager.

Guyot to Use Continental Engine

NEW YORK, Sept. 15—Alfred Guyot, head of the French automobile company of that name, arrived in the United States this week. He will go to Detroit to inspect the new engine which Continental Motors Corp. will make for his new car. The engine will be a Continental sleeve-valve, it is reported.

M. & A.M.A. to Seek Better Sales Basis

Drafts Plan Providing More Definite Understanding on Purchase Agreements

DETROIT, Sept. 16—After months of careful study of marketing conditions in the automotive industry, especially as it has evolved about the practice of close buying, the Motor & Accessory Manufacturers Association in its credit convention at Detroit, this week, adopted a plan of equitable conditions of sale and delivery which it will request its members to follow as closely as possible. The new plan follows:

The Motor & Accessory Manufacturers Association believes that conditions of sale and delivery in the automotive industry should be such as to assure

To the Buyer:

1. Quality products guaranteed against faulty workmanship or materials and conforming, when so agreed, to the specifications of the buyer.
2. Deliveries according to schedule.
3. Lowest possible price commensurate with fair profit for the seller, this profit to make reasonable allowance for an overhead that considers stability of organization engineering service when needed and research leading to improveme....

To the Seller:

1. Purchases which are definite as to quantity and date of delivery.
2. Orders in sufficient quantities and far enough in advance of delivery dates to permit economical purchase, processing and shipping of materials.
3. The sufficient notice of modification of orders to prevent loss as a result of purchase or fabrication of materials not required, or reimbursement if such losses occur.

In order to maintain equitable conditions the association believes suppliers

1. Should quote definite prices only on definite quantities for delivery within a stated period, prices to be adjusted if stated quantities are not taken.
2. Should fix minimum quantities for production runs of specially designed products with definitely stated higher prices if delivery schedules are so small as to necessitate shorter runs.
3. Should promise buyer price reduction in case of declining material costs only if customer agrees to like protection of supplier in case of rising material costs.
4. Should accept cancellation orders only when such action is unavoidable and only upon reasonable reimbursement for losses resulting.
5. Should insist on releases for delivery schedules in ample time to permit economical purchasing, processing and shipping of materials and refuse to modify releases after work is in process.
6. Should adhere to terms definitely agreed upon in extension of credit or granting of discounts.

Harry L. Horning, president, said: "The association has observed the effects of the practices here outlined and believes that the interest of buyers as well as suppliers would be served by their avoidance. Parts making by specialist manufacturers has reached a high state of development essential not only to the progress but to the very existence of the industry. Imposition of conditions damaging the stability of this business would create serious difficulties for parts buyers and would have a harmful effect throughout the entire industry.

"While recognizing the advantage to industry and the public of frequent turnover and low inventories, the Motor & Accessory Manufacturers Association believes that care should be exercised to make every transaction equitable both to the seller and the buyer."

Hudson Tire Maker Enjoined by Court

NEWARK, N. J., Sept. 14—Under a decree by Judge Runyon in Federal district court here, the Hudson Tire Co. of this city is enjoined from using the word Hudson as part of its corporate name or as a trademark for tires, and from using the phrase Hudson Super as descriptive of its tires. The trademark registration is also cancelled. The suit for restraint was brought by Hudson Motor Car Co. on the ground that the use of the name Hudson with the phrase Super Cord and use of an inverted triangle on tires was an attempt to secure advantage at its expense in the automotive field.

In his decree Judge Runyon held that though the Hudson Motor Car Co. did not manufacture tires, tires are so closely allied to automobiles in the public mind that a phrasing or trademark used to exploit a tire which is identical or largely similar to the phrasing or trademark by which a certain make of automobile is known, is distinctly calculated to convey the idea of common origin to the public mind.

Baker Sets Truck Record

NEW YORK, Sept. 14—Setting a new record for a transcontinental truck run, Cannon Ball Baker arrived in San Francisco yesterday morning after driving in 5 days, 17 hours and 36 minutes from New York. Baker drove a standard model T-50 General Motors truck, loaded with 5176 lb. of water from the Atlantic Ocean which will be dumped into the Pacific Ocean. According to the San Francisco advices, he reported no tire changes or mechanical adjustments.

Morgana Leaves Briggs

DETROIT, Sept. 14—Charles Morgana, director of engineering of Briggs Mfg. Co. for the last two years, has resigned to go into private business. He was for five years general production manager at Maxwell and prior to that time was 10 years with Ford Motor Co.

Business in Brief

Written exclusively for* AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co.

NEW YORK, Sept. 15—Wholesale trade appeared to be more active during the past week than either retail sales or manufacturing operations, though sales of chain stores for the month of August registered a substantial increase over the corresponding period of last year. Spurred upward by the government estimate of the cotton crop at 12,692,000 bales as of September 1, the price of this staple reached new high ground last week, but has since receded somewhat. Conditions in the steel industry display an improved tone and further evidence of fall activity is noticeable in the rise of freight car loadings to the highest point of the year. A halt in the decline of commodity prices seems to indicate that for the present, at least, prices are more stabilized than in recent months. Stock prices and brokers loans are at the highest levels in history, though the rate for money available for speculative purposes has in the past week advanced a point or so from the 3½ per cent level.

FREIGHT CAR LOADINGS

Railroad freight car loadings in the week ended Aug. 27 were at a new high for the year to date, numbering 1,109,225, as compared with 1,066,636 in the previous week and 1,128,563 in the like period a year ago. Total loadings so far this year amount to 34,511,482 cars, as against 34,611,028 cars in the corresponding period last year and 33,595,008 cars two years ago.

PETROLEUM OUTPUT

Production of crude petroleum was slightly larger for the week ended Sept. 3, average daily output for that period being 2,512,250 bbl., which compares with 2,506,900 bbl. a week earlier and 2,196,300 bbl. in the corresponding period a year ago.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices rose last week to 144.4, as against 142.1 in the previous week and 135.1 four weeks earlier.

BANK DEBITS

Bank debits to individual accounts, as reported to the Federal Reserve Board for the week ended Sept. 7, were 4.9 per cent below the total of the preceding week though 21.9 per cent higher than the amount reported in the corresponding period of 1926.

For the same period the Federal Reserve banks reported that discounts rose $49,000,000, open market purchases $12,000,000, U. S. Government securities $26,700,000, note circulation $44,300,000, and deposits $8,100,000. Total reserves declined $20,500,000.

Time money and commercial paper were fractionally higher at 3¾ to 4⅜ and 3¾ to 4¼ per cent, respectively.

Ayres Sees Business "Slow but Hopeful"

Says Hope Rises From Low Money Rates—Sees 1927 Final Figures Lower

CLEVELAND, Sept. 12—"Business continues to be slow but hopeful," Col. Leonard P. Ayres, vice-president of the Union Trust Co. declared in the September bulletin issued by the bank. "The slowness is the result of the gradual decline in the production and marketing of goods that has been under way since last spring."

Colonel Ayres pointed out that the hopefulness is founded on the generally accepted belief that current and prospective ease in money rates will bring more than usual autumn stimulation of industry and trade.

"But it now seems probable that the final figures of 1927 will be lower than 1926 in the highly important fundamentals such as automobile output, iron and steel production, mining and transportation. No sharp decline seems in prospect, nor are there present signs of impending sharp upturns.

"The curve in demand for iron and steel, which began rising gently after the low point of the summer's activity was passed early in July, flattened out into a straight line shortly before the middle of August, and so continued the remainder of the month.

"Failure of the improvement to be maintained is attributed chiefly to the automotive situation." Colonel Ayres named delay in Ford models announcement, and stated that motor vehicle production in the first half year was about 15 per cent below the output for the first half of 1926, and the showings for the last half of the year promises to be less favorable.

AC to Expand Production of Panels and Instruments

FLINT, Sept. 12—With the completion of a new three-story building by AC Spark Plug Co., the general offices will be moved and the space vacated will be used for expanding facilities for manufacture of ammeters, oil gages, heat indicators and complete panels for automobiles and motor boats, according to B. W. deGuichard, general manager. The two upper floors of the new building will house the general offices and the lower floor will contain the first aid and employment departments and will also have space for some manufacturing.

Hanna Has Rivet Film

CHICAGO, Sept. 12—Hanna Engineering Works is releasing a motion picture "This is the Age of Riveted Steel," for use without cost to technical societies, clubs, universities, schools, industrial and railroad shops and to all interested in the art of riveting.

August Sales Show Increase Over 1926

WASHINGTON, Sept. 12—August retail sales showed a 7 per cent increase as compared with August, 1926, according to figures compiled by the Federal Reserve Board based on reports from 566 department stores showing the business trend. Monthly sales during August of two of the largest mail order houses were 17 per cent larger than a year ago and the sales of eight chains of five-and-ten cent stores were 15 per cent larger, the board announces. Of the 566 department stores reporting, 386 reported an increase and 180 a decrease.

G.M. Exports Gain 45% in First Half

DETROIT, Sept. 12—A new export record was established by General Motors Corp. during the first six months of 1927, according to Alfred P. Sloan, Jr., who announces that shipments to overseas dealers totaled 92,452 cars and trucks compared with 63,797 in the first half of 1926, an increase of 44.9 per cent. Sales in the first half of this year exceeded those of the last half of last year by 37,458 cars.

Cars sold to overseas dealers of General Motors in the first and second quarter of this year compared with quarters of preceding years, follows:

Period	1927	1926	1925
1st quarter	39,443	31,936	15,577
2nd quarter	53,009	31,861	26,277
3rd quarter		22,799	25,906
4th quarter		32,195	33,134

The figures include the sale of Chevrolet, Pontiac, Oldsmobile, Oakland, Buick, LaSalle and Cadillac in all countries of the world, except the United States and Canada, but do not include the sale of Vauxhall Motors, Ltd., or overseas sales of the products of Yellow Truck & Coach Manufacturing Co.

July Tire Exports Lower

WASHINGTON, Sept. 10—July exports of tires and tubes from the United States totaled $4,165,000 as compared with $4,243,900 exported in June, a decline of about 2 per cent between the two months. The value decline was much less than the volume decline as the unit value for automobile casings increased from $12.43 to $13.43.

Far East Exports High

WASHINGTON, Sept. 10—Automotive products, valued at $88,282,000 are included in record-breaking United States exports to the Far East during 1926, the U. S. Department of Commerce announced this week.

DuPont Affiliations Disclosed in Report

No Stock in Delaware Corporation Held by General Motors or Steel

NEW YORK, Sept. 10—In response to a notice from the Federal Trade Commission, Irenee duPont, chairman of the finance committee of E. I. duPont deNemours & Co., Inc., has detailed the relationships between the United States Steel Corp., General Motors Corp. and the duPont company.

Mr. duPont's letter to the commission adds little to what has long been common knowledge. E. I. duPont deNemours & Co., Inc., owns 1,966,244 shares of General Motors common stock out of a total of 8,700,000 shares outstanding. Between May 10 and June 15, 1926, the company purchased the equivalent of 114,000 of the present shares of the United States Steel Corp. at a cost of $14,005,392. The Steel corporation has 7,116,235 shares of common stock and 10,719,046 shares of voting stock.

Mr. duPont continues: "The United States Steel Corp., as far as we know, owns no stock in the General Motors Corp. nor in E. I. duPont deNemours & Co., Inc., nor in any of their subsidiaries. The General Motors Corp. owns no stock in E. I. duPont deNemours & Co., Inc., nor in the United States Steel Corp. or any of their subsidiaries.

"The above comprises all relationships between the United States Steel Corp. and E. I. duPont deNemours & Co., Inc., of which I have knowledge."

Monroe Auto Equipment Increases Capitalization

MONROE, MICH., Sept. 12—Monroe Auto Equipment Mfg. Co. is increasing its capitalization to $1,500,000 and the company will reorganize to manufacture on a more extensive basis. The company recently was awarded a contract for equipment by a leading car manufacturer, the demand arising from this requiring the addition of extra factory space and additional help. To meet this the company is building an addition to the present factory. A new high daily record was established Sept. 9 when 9000 tire pumps were produced.

Duco Shows New Colors

WILMINGTON, Sept. 12—A new Duco color book of "Allonge" colors for automobile manufacturers has been completed and is ready for issuance by the chemical products division of the E. I. du Pont de Nemours & Co., Inc. It has been prepared under the direction of H. Ledyard Towle, director of the Duco color advisory service and contains suggestions for new harmonies based on latest color researches.

Morris Reduces Prices £6 to £40, Presents New Morris-Oxford Models

LONDON, Sept. 1 (*by mail*)—The Morris program for 1928 was announced today. Price reduction occur to all models without exception, while two new models consist of an 11.9 hp. Oxford phaeton and saloon; hitherto the Oxford or higher-grade Morris cars have all had the 14-28 hp. engine.

The program still consists entirely of four-cylinder chassis, *i. e.*, the 11.9 hp. Cowley, the new Oxford at the same rating, the 14-28 hp. Oxford and the 15.9 hp. Oxford. Only one model is offered without front brakes, viz., the cheapest of the range, the Cowley two-seater with simplified equipment and rear brakes only, the price being reduced by £6 to £142 10s. A four-door sedan is added to the Cowley range, supplementing the two-door model with a price £10 below that applying to the latter in 1927, while the two-door sedan is reduced £17 10s.

Only detail alterations occur. Automatic screen wipers are now fitted to all models except the lowest priced. On both the Oxfords and the Cowleys a running-board toolbox is now to be fitted, and certain small additions occur to the accessory equipment. A new standard body color has been adopted; this is known as beige, and is a pleasing biscuit shade; it is optional on all types, including the cheaper sedans, which hitherto have been supplied only in blue.

The 11.9 hp. Oxford phaeton and saloon have been added to the range as a result of a demand for a higher grade finish in the bodywork and greater roominess than the Cowley types on the same chassis. On the larger Oxfords the windows have now been rounded, and a natural grain leather has been adopted for the upholstery. The backrests of the adjustable front seats are now capable of being folded back to meet the rear cushion and form a bed if desired, and the angle of cushion and backrest is adjustable as well as the leg reach. A single-pane top-hinged screen is now fitted in place of the two-panel type.

The following is the complete Morris program and list of new prices, with old ones for comparison:

	New Prices £ S.	Old Prices £ S.
11.9 hp. Morris-Cowley two-seater*	142 10	148 10
11.9 hp. Morris-Cowley two-seater	152 10	160 0
11.9 hp. Morris-Cowley phaeton	170 0	177 10
11.9 hp. Morris-Cowley ¾ coupe	175 0	182 10
11.9 hp. Morris-Cowley two-door sedan	177 10	195 0
11.9 hp. Morris-Cowley four-door sedan	185 0	... ..
11.9 hp. Morris-Oxford five-seated phaeton	205 0	... ..
11.9 hp. Morris-Oxford four-door sedan	215 0	... ..
14-28 hp. Morris-Oxford two-seater	210 0	220 0
14-28 hp. Morris-Oxford five-seated phaeton	225 0	240 0
14-28 hp. Morris-Oxford ¾ coupe	230 0	245 0
14-28 hp. Morris-Oxford four-door sedan	250 0	265 0
14-28 hp. Morris-Oxford Saloon landaulet	285 0	325 0
15.9 hp. Morris-Oxford four-five-seater	315 0	325 0
15.9 hp. Morris-Oxford four-door sedan	345 0	375 0

* Rear brakes only and simplified equipment. All other models have four-wheel brakes.

France Lowers Tariffs on German Automobiles

PARIS, Aug. 30 (by mail)—By reason of the Franco-German commercial treaty to take effect Sept. 6, German automobiles will enter France under the 45 per cent ad valorem duty, plus the state luxury tax, at present applied to all other nations. This agreement abolishes the present 180 per cent duty which was an effective barrier against the importation of any German automobiles. It is not believed that the change will cause any appreciable number of German automobiles to be placed on the French market. Even before the war the only German firm doing business in France was Mercedes and the French industry is now so powerful that it has nothing to fear from German competition on the home market.

French automobiles can be imported into Germany under the most favored nation clause. At present the number of French cars sent into Germany is an average of 150 per month. In addition, Citroen is assembling cars in this German plant.

White Export Sales Show 35% Increase

CLEVELAND, Sept. 10—All records for foreign deliveries of White trucks and buses have been broken by the export region of the White Co. Deliveries abroad during July and August showed an increase of 107 per cent over the same months of last year, while Canadian deliveries increased 60 per cent.

Increase for the entire eight months to Sept. 1, is 35 per cent over the corresponding period in 1926. Increases have been widespread in all territories. The Australian division was the high point for July and August. Buses exported during the first seven months of 1927 equalled total 1926 deliveries.

"This increase in business can be attributed to White organization strength in the field," Jay Rathbun, vice-president of the export region declared. "We have resident managers in every important market region in the world. Fleets are continually being built up by these men."

Chile Tariff Action Halts Sales Market

WASHINGTON, Sept. 14—The announcement by the Chile mixed congressional committee, that import duties on automobiles and trucks, imported into Chile, might be lowered, has paralyzed the automobile market of that country, Commercial Attache Ralph H. Ackerman, cables the Department of Commerce.

He reports that purchasers are holding off buying in the hope of getting a better price with the reduced tariff, which has been expected for some time, but which has not yet materialized. Just when it will go into effect is uncertain, the cable says. A large number of automobiles are being held in the custom warehouses at Valparaiso.

Austin Reduces Prices, to Offer New Light Six

LONDON, Aug. 30 (*by mail*)—Austin, in announcing appreciable reductions in the prices of all current models, specifies a new light six, termed 16 hp., with deliveries to commence on March 1 next. The phaeton model is priced at £355 and the sedan £395. No details may be given at the moment as to its constructional features.

With regard to current models, the following are the new and old prices:

	New Price	Old Price
7 hp. Phaeton	£135	£145
Sedan	150	165
12 hp. Phaeton	255	275
Sedan	325	350
20 hp. Four Phaeton	425	450
Sedan	475	495
20 hp. Six Phaeton	525	...
Landaulet	675	775

Madrid Has New Engine

WASHINGTON, Sept. 10—Development of a new type of internal combustion automobile engine which operates without valves and is cooled by compressed air is announced in a bulletin received from Madrid by the U. S. Department of Commerce. The new engine, it is claimed, is smaller, noiseless and is capable of higher speeds on less fuel than the ordinary engine. The engine includes a new carburetor which maintains a constant mixture at all speeds and a new spark plug designed to automatically clear itself of oil.

Uruguay Show Date Set

WASHINGTON, Sept. 10—The fifth annual automobile show of Uruguay will be held in Montevideo, Nov. 19 to 27, it was announced by the automotive division, Department of Commerce.

Men of the Industry and What They Are Doing

Oakland Makes Changes in Eastern Sales Zone

F. R. French has been appointed by Oakland Motor Car Co. special sales representative for all eastern districts, a newly created position as contact between the factory and field sales organizations. Mr. French has been connected with the industry for 20 years, representing the Everitt car in the early days on the Pacific Coast and recently serving as Studebaker branch manager in Washington.

Other changes in the eastern sales organization bring W. A. Sullivan, former Charlotte district manager, to succeed G. V. H. Cairns, as district manager at Atlanta. Mr. Cairns takes the newly created post of New York retail sales manager. T. K. Johnson has been made assistant district manager at Atlanta; W. M. Buck, assistant district manager at Pontiac, and C. W. Mellen, assistant district manager at Pittsburgh.

Hubbs Joins Pierce-Arrow

George C. Hubbs has been appointed assistant to Myron E. Forbes, president of Pierce-Arrow Motor Car Co., in which connection he will give support to L. E. Corcoran, general sales manager of the company, in carrying out a program of sales expansion. Mr. Hubbs was formerly a sales executive with Dodge Brothers, Inc., Nash Motor Co., and recently with Durant Motors, Inc.

Randall Now at Factory

J. E. Randall, former New York representative of Young Brothers Co., Detroit, has been added to the headquarters' staff at the factory. For the past 10 years Mr. Randall has specialized in oven work and industrial baking problems.

Halley Special Sales Aide

D. G. Halley has been promoted by Gardner Motor Co. and will make his headquarters at the factory where he will handle special sales work for Russell E. Gardner and Col. Halsey Dunwoody. For the past two years Mr. Halley had been eastern sales manager.

Allen Resident Manager

Elliott A. Allen has been appointed resident manager for the New Departure Mfg. Co. on the Pacific Coast, making his headquarters in the new branch engineering office at San Francisco, opened recently to provide engineering services for the Pacific Coast trade.

Perryman Changes Position

Charles A. Perryman, formerly sales manager of the wire rope department of the Wickwire Spencer Steel Co., Inc., is now associated with the American Cable Co. as assistant sales manager, with headquarters in New York.

Bunting Trademark With Dad Abroad

J. W. Bunting, president, of the Bunting Brass & Bronze Co., Toledo, is making an extended investigation of European markets with reference to Bunting products. He sailed on Sept. 17 for England where he will make his headquarters for several weeks. He was accompanied by his little son Bruce who is the "Baby Bunting" shown in the Bunting trade mark. Among other places he will visit is the town in Ireland where his father, W. H. Bunting, founder of the company, began his apprenticeship in the bronze industry almost 70 years ago.

Secretaries Attend Meetings

John C. Long, secretary of the street traffic committee of the National Automobile Chamber of Commerce, will be in Washington, Sept. 24 for a meeting of the traffic committee of the Highway Research Board called by William E. Metzger, chairman of the committee. Mr. Long also will attend the meetings of the National Safety Council in Chicago, Sept. 26-30.

H. R. Cobleigh, secretary of the service committee of the N. A. C. C., is in Shawnee this week for the convention of the Automotive Electric Association.

Flannagan Heads Washer Sales

R. K. Flannagan, formerly of the Larkin Automotive Parts Co., Dayton, has been appointed sales manager of Speed Spra automobile washers by the Hayes Pump & Planter Co. of Galva, Ill. Mr. Flannagan has been connected with the automotive industry for the last 15 years.

Boucher With Pennsylvania

H. H. Boucher, for the last six years identified with the B. F. Goodrich Co. branch in Los Angeles, was recently appointed manager of the Southern California territory of the Pennsylvania Rubber Co. His headquarters in his new post will be in Los Angeles.

Garner in Parts Business

G. L. Garner, formerly assistant general sales manager of the Republic Gear Co., Detroit, has purchased an interest in the C. H. Mountjoy Parts Co., San Antonio, and removed to San Antonio.

Wilmer on European Trip

E. G. Wilmer, president of Dodge Brothers, Inc., is on a European trip from which he will return in the early fall.

Record Foreign Group to Attend A.E.A. Show

The largest delegation of representatives and leaders of the automotive world from overseas ever to attend an equipment show in the United States have already signified their intention of being present when the ninth annual trade show of the Automotive Equipment Association opens its doors at the Coliseum, Nov. 7. They are to be feted at a banquet in the Hotel Stevens, Nov. 9, according to an announcement from national headquarters.

The banquet is to be featured by special addresses on important trade topics by nationally known speakers, and by an elaborate entertainment program, states George E. Quisenberry, chairman of the banquet committee, who is being aided in the preparatory work by his fellow committee members Karl Brunner and C. M. Wynne.

Metzger Back From Europe

William E. Metzger, director of the National Automobile Chamber of Commerce, who has returned from Europe, said that motor transportation in Ireland is going forward at a more rapid rate than any other country which he visited. Not only increased prosperity for the country but, due to its gains in transportation, a great future for the tourist trade is seen by him.

Elwell Plant Manager

F. D. Elwell has been appointed plant manager of Olds Motor Works. Mr. Elwell joined General Motors in 1917 as assistant maintenance engineer of the Dayton Engineering Co. He continued with the Dayton company, serving in various capacities including superintendent of the maintenance division until Sept. 1 this year, when he resigned to accept the position at Olds.

McKeever Moved to Michigan

A. E. McKeever, former general manager of the Hertz Drivurself automobile rental stations in Philadelphia has been appointed assistant general manager of the Hertz stations operating in Michigan and Indiana.

Ballantine Opens Office

N. D. Ballantine has resigned as assistant to the president of the Seaboard Air Line Railway Co., to establish an office as consulting engineer in railroad and transportation matters, with headquarters in the Transportation Building, New York.

Miltner Directs Personnel

A. D. Miltner has been appointed director of personnel for Olds Motor Works. Mr. Miltner joined Hyatt Roller Bearing Co. in 1915, later going with Remy.

Campaign is Started for Car Tax Repeal

N. A. C. C. and A. A. A. Bulletins Seek General Support in Congress Action

WASHINGTON, Sept. 10—Another determined fight for the complete elimination of the automobile excise tax will be made during the coming session of Congress, it has been announced by the National Automobile Chamber of Commerce. The fight probably will begin when the House ways and means committee meets Oct. 31 to begin the framing of a new tax program. Efforts also will be made on behalf of automobile manufacturers to have the corporation income tax rate reduced to at least 10 per cent.

In its stand for elimination of the automobile excise tax the N.A.C.C. has just been joined by the American Automobile Association, with the further backing of the following organizations: American Drivurself Association, American Farm Bureau Federation, Automobile Body Builders' Association, Automotive Equipment Association, Motor and Accessory Manufacturers Association, National Association of Taxicab Owners, National Automobile Dealers Association, National Battery Manufacturers Association, National Grange, Rubber Association of America, Inc., and United States Chamber of Commerce.

In an effort to create public sentiment for the program, the A.A.A. has just published a pamphlet headed: "The Discriminatory War Motor Excise Tax, a Tax Levied in 1917 for War Purposes, the Burden of Which to Date Has Amounted to $1,060,000,000, the Only Remaining War Tax on Transportation—It Should Be Repealed." It is planned to circulate thousands of these pamphlets throughout the nation, and is asking the cooperation of automobile manufacturers and dealers to this end.

The N.A.C.C. also has issued a bulletin of similar import, requesting all interested parties to make the repeal of the excise tax a personal issue with their congressional representatives. The bulletin is signed by J. S. Marvin, assistant general manager.

Republic Issues Bonds to Expand Linn Sales

NEW YORK, Sept. 13—National distribution of Linn tractors is contemplated by Republic Motor Truck Co., Inc., which has just announced a new issue of $1,250,000 ten-year 6½ per cent collateral trust sinking fund gold debentures in connection with the purchase of all the issued and outstanding capital stock of the Linn Mfg. Corp. of Morris, N. Y.

Sale of Linn tractors has hitherto been about 90 per cent confined to New York State. In view of the consolidation, distribution will be effected through 12 factory branches, 105 direct factory distributors in the United States, and 49 in 25 foreign countries, in addition to dealers appointed by distributors.

Debentures are priced at 95½ and interest, to yield over 6½ per cent. Nondetachable stock purchase warrants are attached to each $1,000 debenture, entitling the holder to purchase common stock in varying amounts up to June 30, 1930, at prices from $5 to $7.50 per share.

Willys Assets Show $1,500,000 Increase

TOLEDO, Sept. 12—Willys-Overland reports a sales increase of 9 per cent in the first eight months of the year and a considerable increase in financial strength in the last two months. John N. Willys, president, said current assets stand at $17,016,804 as of Aug. 31 as against current liabilities of $8,295,814. At the half-yearly statement time cash and current assets were $15,552,814. At the half-yearly statement time cash and current assets were $15,552,165, and current liabilities, $11,062,201.

During this period $1,000,000 in bonds and $745,900 of preferred stock were retired. The company now has $6,000,000 bonds and $16,520,700 par value of preferred stock outstanding.

Sales for the eight months ending Sept. 1 were 152,106 units as compared with 138,188 units in the same period last year. Foreign sales have shown nearly 50 per cent gain and the Canadian sales have increased by 68 per cent.

Mr. Willys is very confident of the sales outlook for the rest of the year and for good business next spring.

Sir William Letts, managing director of Willys-Overland Crossley, Ltd., returned with Mr. Willys.

Van Schaick and Wheeler Buy Ford Chain Block Co.

PHILADELPHIA, Sept. 15—Control of the Ford Chain Block Co., this city, has been purchased by A. P. Van Schaick and W. F. Wheeler, as individuals, and the company has been reorganized and incorporated. There is no change in name and the company will continue the manufacture of its present product.

Mr. Van Schaick is president under the reorganization; Mr. Wheeler, vice-president and treasurer, and G. E. Sullivan, secretary. Mr. Van Schaick and Mr. Wheeler are widely known in the industry as executives of the American Chain Co., with which company they continue.

Argentine Show in November

NEW YORK, Sept. 12—The Argentine automobile show will be held in the Pabellon se las Roses from Nov. 10 to 20 and will be under the joint management of the Automobile Importers Association and the Automobile Club.

Financial Notes

India Tire & Rubber Co. has discontinued all negotiations relative to the issuance and sale of $1,500,000 10-year sinking fund 6 per cent gold debentures. Action on this was scheduled for stockholders' consideration in June but was adjourned. Operations for the seven months ended July 31 resulted in net profits of $215,056 after all charges.

Paige-Detroit Motor Car Co. directors have declared an initial dividend on the second preferred stock. A quarterly dividend at the rate of 7 per cent per annum was adopted. The regular dividend on the preferred stock was also declared. Dividends on both stocks are payable Oct. 1 to stock of record Sept. 15.

Mullins Body Corp. reports net profit for August of $75,974, after all charges except taxes, against $22,037 in August, 1926. This is the company's biggest month of the year to date.

Borg & Beck Co. stockholders will be offered the right to subscribe at $40 a share to seven shares for every 100 shares held. Value of the rights at the present market is something over $2 a share.

G.M. Stockholders Vote Stock Change

WILMINGTON, DEL., Sept. 12—Stockholders of General Motors Corp. at a meeting here today approved the two for one split-up of the common stock and changes in authorized shares previously recommended by the directors. Exchanges of old for new stock will begin Sept. 15.

Common stock outstanding after the split-up will number 17,400,000 shares of $25 par stock. Authorized common will be increased 10,000,000 shares common, no par, and 30,000,000 shares, par $25.

Other changes authorized by the stockholders include a reduction in the number of 6 per cent preferred and debenture stocks authorized to equal the number of those issues now outstanding. The 7 per cent preferred remains unchanged. There are 17,449 shares of 6 per cent preferred and 25,949 of 6 per cent debenture.

Gifford to Change Name

LANSING, Sept. 10—The Gifford Engine Co. is considering plans to change its name to the Gifford Engineering Co. When the company was organized 20 years ago it manufactured engines, but about 10 years ago discontinued this line and has since been making automobile parts, specializing in bronze and steel bushings.

Names Argentine Distributor

ST.LOUIS, Sept. 14—Moon Motor Car Co. announces the appointment of Bresler & Co., as distributor of Moon and Diana cars in the Argentine.

Cincinnati Pleased With Sales Outlook

August Increase Believed Forerunner to Good Fall —Used Car Sales Better

CINCINNATI, Sept. 10—An increase of 114 new car registrations last month compared with July is gratifying to Cincinnati dealers, and, in the opinion of President J. W. Tarbill, of the Cincinnati Automobile Dealers Association, is the forerunner of an upward movement that will continue through the fall period.

Dealers are much gratified over conditions that prevailed in August despite adverse weather conditions, and a very apparent pick-up during the last 10 days is cited as an indication of the trend upward.

Total registrations of new cars for Hamilton county during August were 1580, as compared with 1746 in August, 1926. The fact that Ford was out of the picture last month again is pointed to as the reason for the 266 decrease, to a great extent.

Used car sales this year in August totaled 4265 as against 4313 in August a year ago. August used car sales this year were 210 greater than July. There was a noticeable slump in July used car business, as compared with the year previous. Of the 4265 used car sales last month 86 per cent were made by members of the Cincinnati Automobile Dealers Association.

While the sales volume for a scant dozen better known cars showed unusual increases that brought up the total for last month, business with the majority of dealers showed a falling off as compared with last year.

Cleveland Sales Off in August

CLEVELAND, Sept. 12—Hesitancy by the public to buy until new Ford models are out constitutes the main cause of an August drop indicated by new and used car figures released by the Cleveland Automobile Manufacturers and Dealers Association. In August, 1927, 2955 new cars were sold, as compared with 3441 in August, 1926. Used car sales total 10,792, as compared with 10,517 in August, 1926. Though uncertainty is expressed in many quarters, a steady climb is forecast when the new Fords are announced. Few Fords have been sold recently. Accessories and parts remain steady with a possible slight decline.

Marmon Gets Big Order

INDIANAPOLIS, Sept. 16—Marmon Motor Car Co., has received an order for 80 Marmon eights from Pass & Joyce, Ltd., London, Marmon distributor in the British Isles. The shipment is to cover retail sales and to round out the display at the Olympia show. This is the largest single export order Marmon has ever received.

Canadian Highways Increase 5788 Miles

WASHINGTON, Sept. 16—The Canadian highways act of 1919, which is similar to the United States Federal Aid act, is resulting in a great amount of highway construction throughout the Dominion and has led to a systematic development of tourist trade as one of the methods of advancing economic life in every part of Canada, according to an article in the Commerce Reports of the U. S. Department of Commerce.

Under the act last year the sum of $45,563,000 was spent on 46,824 miles of provincial highways in Canada. Of this sum $29,585,000 was expended on construction of 5788 miles of new roads and $15,978,000 on maintenance of 41,036 miles.

Grant Sees 1,000,000 Sales Assured for 1927-28 Year

BOSTON, Sept. 10—Vice-President R. H. Grant, sales manager of the Chevrolet Motor Co., accompanied by M. D. Douglas, assistant sales manager; H. L. Horton, regional sales manager, Tarrytown, and R. S. Clendennin, regional zone manager, Portland, Me., visited Boston this week where he addressed 750 dealers and salesmen from all parts of New England. He told them that the goal for the 1927-1928 year was 1,000,000 cars and that the way the orders were coming in that the goal would be reached. Mr. Douglas spoke on salesmanship. H. J. Walsh, manager of the Boston regional zone, presided. The meeting was opened with a luncheon and entertainment.

Chevrolet Lets Contracts

FLINT, Sept. 7—Chevrolet Motor Co. has let contracts approximating $1,000,000 to the H. G. Christman Co. for the construction of additions to the main plant here. The contract calls for the erection of a group of structures, including plant No. 9, a personal building, officers' garage, pump house and river wall.

Seeks Safety Ideas

WASHINGTON, Sept. 12—Prizes totaling $1,000 have been offered by the American Road Builders' Association for the best ideas for reducing the number of highway accidents occurring each year. The contest is being held in connection with a national safety campaign and is open to everyone. It is designed to bring out "the best workable plan that will decrease street and highway accidents."

Wayne County Sales Show 18,200 Drop

Ford Sales in August Total 41 —Commercial Car Sales Fall 2400

DETROIT, Sept. 10—A total of 4803 new passenger cars were sold in Wayne county in August, figures compiled by the Detroit Automobile Dealers Association show. This brings the total sales for the year to 41,906 cars compared with 60,106 units during the same period, last year. Commercial car sales totaled 236 in August bringing sales for this classification to 3843 for the year compared with 6214 during the same time, last year.

Buick led in passenger car sales with 858 units. Next came Chevrolet with 651, Essex 512, Chrysler 486, Oakland 399, Pontiac 333, Studebaker 264, Hudson 206, Nash 196, Dodge Brothers 158, Packard 146, Oldsmobile 127. Sale of Ford cars hit a new low level for recent years, aggregating only 41 units. This was to be expected, however, as the company is out of production preparing for the new Ford cars.

Chevrolet topped commercial car sales with 119 units and was followed by Graham Brothers with 24, Ford with 19 and G. M. C. with 17.

Spokane Sales 485 in August

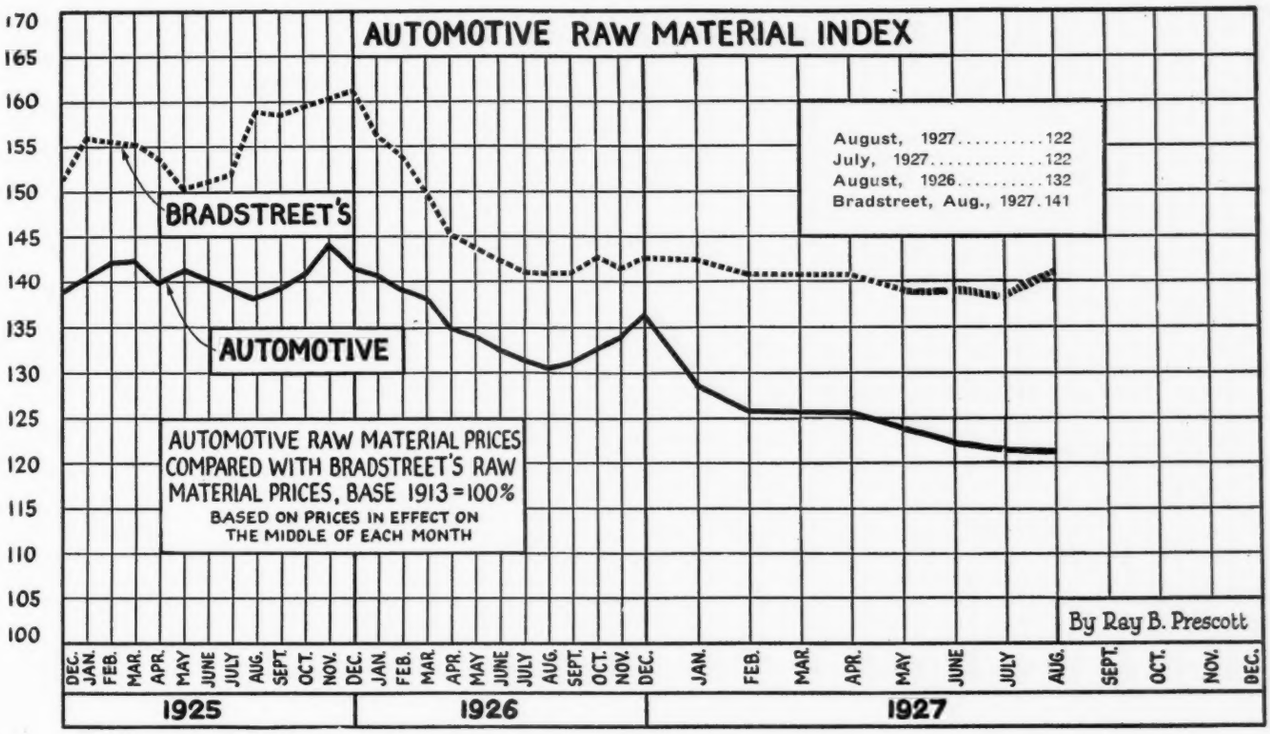
SPOKANE, Sept. 12—Automobile sales in Spokane county as reflected in registrations during August were 485 cars, bringing the total registrations since Jan. 1 to 3368. Chevrolet led in August with 76, Willys-Knight-Whippet was second with 67, Oakland-Pontiac third with 62 (this being the strongest position ever shown by this line here), Buick fourth with 50, Hudson-Essex fifth with 40, Nash sixth with 32, Star seventh with 27, Studebaker-Erskine eighth with 23, Dodge ninth with 20, Chrysler tenth with 18 and Ford eleventh with 14.

For the eight months' period Chevrolet leads with 688, Ford is second with 390, Willys-Knight-Whippet third with 369, Hudson-Essex fourth with 286 and Buick fifth with 234.

Heater Patent Reversed

WASHINGTON, Sept. 12—Patent No. 1,637,596 for a heater for automobile water-cooling system, granted to Edgar A. Turner, on Aug. 2, this year, has been reversed by the U. S. Commissioner of Patents who on reexamination declares there are not sufficiently new ideas embodied in the invention and denies the claim. The invention related to a water-cooling system for an automobile engine and dealt with the problem of preventing freezing in cold weather of the water in the water jacket of the engine, radiator and connecting pipes. This was to be prevented by a system of steam heating the engine unit.

Raw Material Prices Maintain Level



Southeast Business Shows Upward Trend

ATLANTA, Sept. 10—Dealers here say the outlook for automotive business in the Southeast this fall, including accessories, tires and equipment, pleasure cars and trucks, is the best it has been in the past four or five years. The opinion is based on the substantial improvement in accessory and tire sales to retail dealers in this territory in the past two or three weeks, and the fact that high prices prevail for most of the important southern crops. It is now easier to quickly place automotive paper with banks than it has been for a long while. Demand for machine tools and equipment from garages and service stations also has shown a substantial improvement, distributors say, and they look for this business also to be the best this fall that it has been in three or four years.

To Manufacture Accessory

CLEVELAND, Sept. 10—Establishment of the Ilerite Mfg. Co. here has been announced. The company will manufacture insulated live line testers and other electrical devices. One of its specialties will be an automobile stop light equipped with a small motor, operating signal arms. George Arthur, Iler, president of the company, will move from Youngstown to Cleveland and be active in the business. A. L. Krosen is vice-president and general manager.

Tariff Board Investigates Foreign Glass Industry

WASHINGTON, Sept. 14—The U. S. Tariff Commission's investigation of tariff rates on plate glass assumed international proportions this week when the commission ordered a survey of foreign manufacturers, and particularly the glass industry in Belgium. The tariff question is of interest to the automobile manufacturers because they use 50 per cent of the entire production.

The commission announces that it has completed the domestic survey covering 90 per cent of the industry. Domestic producers are seeking a higher tariff alleging that foreign makers are able to unfairly compete with them.

American Competition Cuts Fiat Sales 50%

WASHINGTON, Sept. 15—Largely because of American competition in the Spanish and Swiss automobile markets, the sales of the Fiat Co., leading automobile manufacturer of Italy, have decreased 50 per cent the first three months of this year compared with the same period last year, according to cable to the Department of Commerce from the American consul.

Packard Executives Meet Distributors

RYE BEACH, N. H., Sept. 10—The annual get-together gathering of Packard distributors throughout the country was held here this week. The distributors came here Wednesday and were lodged at Stoneleigh Manor, close to the home of Governor Alvan T. Fuller, of Massachusetts, who is their host. He is the Packard distributor for New England. The governor took over the manor so that there would be no interruptions to the plans for a genial good time.

The factory was represented by President Alvan Macauley, Secretary M. A. Cudlip, Vice-Presidents J. G. Vincent, E. F. Roberts and H. H. Hills, General Sales Manager R. E. Chamberlain, H. N. Davock, general service manager, F. H. McKinney, advertising manager, and J. J. Marks, comptroller.

Chryslers Win Polish Cup

DETROIT, Sept. 15—Three Chrysler cars have succeed in winning the trophy offered by the Automobile Club of Poland, according to word received by the Chrysler Sales Corp. The trophy was offered for any team of three cars which finished a specified reliability run without any black marks. The trophy has been offered for the past 15 years and has never been won before.

Homeopathic Buying Rules Steel Demand

Contracts by Parts Makers Show Slight Upward Trend —Prices Hold Steady

NEW YORK, Sept. 16—The leading steel producer's latest unfilled tonnage statement, showing a gain of 54,023 tons or about 1¾ per cent increase over the preceding month's backlog, is fairly representative of conditions in the steel industry. This is perhaps merely a coincidence because the steel market no longer looks upon the U. S. Steel Corp. unfilled tonnage statements as an infallible trade barometer, the change from long range to hand-to-mouth buying having diminished its importance.

It is sensed in the market, however, that gains in the demand are along homeopathic lines, and it is quite likely that with the railroads about to place their annual contracts for steel rails, which will considerably sweeten the leading interest's backlog without in any way changing the general industrial steel demand, the corporation's next unfilled tonnage statement will be as wide of the mark as the one for Aug. 31 has been close to it.

Minute growth in the demand is accompanied in some descriptions of steel by enhanced price firmness, steel bars apparently lead in the recovery. A month ago, round lots of steel bars carried at times concessions of from $3 to $4 a ton from the nominal market quotation, but in recent transactions better prices appear to have been obtained. The market for cold-finished bars, therefore, has a stronger undertone. In sheets, however, more or less price irregularity continues.

Aside from occasional sales by jobbers at prices below those of mills, it is suspected that here and there a mill, anxious to keep its wheels turning, will shade the price on attractive business. Larger producers, however, prefer to cut rate of operations rather than prices. Steadiness continues in the cold-rolled strip steel market.

No spectacular gains are noted in automotive demand, but at the same time there appears to be a slight uptrend in the number of orders placed by parts makers. With a microscope necessary to detect changes in the steel demand these days, telescopic forecasts of the future are altogether out of the question.

Pig Iron—The price for foundry and malleable irons remains nominally at $17.50, Valley furnace. Automotive foundries show little interest in the market.

Aluminum—Latest Government statistics reveal aluminum imports in July to have aggregated 10,700,000 lb., two-and-half times what they were in July, 1926, and constituting the heaviest imports in any one month since December, 1925. This influx came by no means upon light bonded warehouse stocks for these aggregated 5,431,138 lb. on July 1. The market remains unchanged, with Detroit consumers reported to be taking foundry metal in somewhat more liberal quantities. Berlin advices state that the sole American producer has acquired a large block of shares in the so-called Bauxite Trust.

Copper—Improvement in the statistical position of copper is reported. Producers appear to have the situation fairly well in hand, their price policy, however, being largely influenced by the export demand.

Tin—Consumers appear in no hurry, seemingly waiting for further dips.

Lead—The lead market answers predictions of a lead ore famine with a return to low prices that prevailed in July, the lowest in three years.

Zinc—The market is quiet and steady.

Farmer Coming Back, Minnesota Reports

MINNEAPOLIS, Sept. 13—Leading distributors exhibited at the annual fall automobile show in connection with the Minnesota State Fair with gratifying interest from prospects, indicating that the farmer is returning to buying power and with good crop prospects is considering rehabilitation of his automotive equipment. Notwithstanding unusually wet weather attendance was several hundred thousand. A large quantity of tractors was displayed on Machinery Hill. The government and local distributors made a new contribution with a tent show of aircraft.

New Company Acquires Universal Products Co.

OSHKOSH, WIS., Sept. 10—The United States Motors Corp., with capital stock $200,000, has been organized by Oshkosh capital to take over and further develop the entire business of the Universal Products Co. E. H. Huesener, for the past seven years general manager of the Universal company, becomes president of the new corporation, which now is owned and controlled entirely by Oshkosh men. Rufus K. Schreiber is vice-president and treasurer; J. J. Bruske, secretary, and W. G. Maxcy, director.

John B. Kennedy

NEW HAVEN, Sept. 10—John B. Kennedy, president of the English & Mersick Co., died at his summer home this week. He was born at White Plains, New York, in 1864, and entered the employ of the English & Mersick company in 1880 as office boy. He became vice-president in 1895, when the company was incorporated, and became president in 1898, holding this position until his death.

Small Balloon Rims Show Important Gain

Total Rim Inspection in August Falls Below 1926—Pressure Types Drop

CLEVELAND, Sept. 12—The rim inspection report of the Tire & Rim Association of America, Inc., shows a total of 1,825,905 for August this year as against 2,378,850 in August, 1926. For the first eight months of 1927, inspections totaled 14,926,999 as against 17,697,955 in the same period last year.

Comparisons on leading sizes follow:

			August 1927	August 1926
Clinchers		30 x 3½	161,769	169,462
Balloons	18"	26 x 4	47,974	20,907
"	19"	26 x 3½	44,749	64,010
"	19"	27 x 4	166,320	.....
"	19"	28 x 4½	56,523	.....
"	20"	27 x 3½	78,189	186
"	20"	28 x 4	295,069	226,609
"	20"	29 x 4½	48,569	15,675
"	20"	30 x 5	67,026	13,628
"	21"	28 x 3½	437,609	987,323
		29 x 4	80,614	351,453
		30 x 4½	116,546	207,578
Truck	20"	30 x 5	114,720	109,145

Total inspections of high pressure rims in August, 1927, was 38,267 as against 102,099 in August last year. High pressure rims inspected in the first eight months totaled 342,252 as against 615,273 in the same period last year. Balloon rims in the 18 in. and 19 in. group showed large increases in the first eight months, the 18 in. group totaling 628,136 as against 24,676, and the 19 in. group, 1,498,217 against 186,774. Declines were shown in the 20 in., 21 in. and 22 in.

Airplane Exports Disclose Increase in Unit Value

WASHINGTON, Sept. 14—Exports of airplanes from the United States the first six months of this year totaled $311,610. Exports of engines for aircrafts totaled 69, valued at $123,892, and parts exported totaled $189,178, the automotive division of the Department of Commerce announces.

Comparing the exports with the first six months of last year they decreased from 26 completed planes to 19 planes, but the value was higher, the average 1926 unit value being $4,729, compared with $16,400 unit value the first six months of this year. Chile took the largest number (seven) of airplanes, and Canada took 53 of the 69 engines exported and also a third of the parts.

Mansfield Tire to Build

MANSFIELD, OHIO, Sept. 14—Mansfield Tire & Rubber Co. is soon to start construction of a three-story addition which will make an additional 90,000 sq. ft. of manufacturing space available by about March 1, according to G. W. Stephens, president. The fiscal year ending Sept. 30 will be the most successful in the company history.

Rubber Act Change Coming Next Month

Failure of Restrictions During Year Leads Concern to Probable Action

NEW YORK, Sept. 12—With the Stevenson Act expiring Oct. 31, at the end of the current restriction quarter, tire manufacturers and other interests using crude rubber are becoming increasingly concerned with the probable action of the British authorities in extending, modifying or abandoning the restriction scheme.

Directly contrary rumors have been circulated in various quarters but the British government has been silent. Official announcement is expected any time after Oct. 1.

In the current quarter exportable allowances from the restricted areas have been 60 per cent of standard production, which for Malaya is set at 333,840 tons annually. It has been widely realized, however, that this standard is higher than the possible full production of the areas, and the forthcoming action by the British authorities, with rubber now around 34 cents, may involve a lowering of the standard as well as maintenance of the 60 cent allowance.

From a practical standpoint the Stevenson Act has failed of its objective this year, in that there has been an ample supply of rubber on hand and the price has failed to stay at the level desired by the British. There have even been rumors that the attempt at price control will be abandoned entirely. Although this report has been widely discredited, the mere possibility is enough to cause a great deal of apprehension in view of the heavy inventory losses which would be suffered were restrictions to be abandoned.

Tire Shipments Maintain High Level for Season

AKRON, Sept. 14—While automobile tire production so far in September has been slightly below the high levels prevailing last month, shipments to dealers are above normal for this time of the year, and retail sales are holding up better than was expected. Owing to curtailments at some of the automobile plants, not quite as many tires are being purchased for original equipment. The rubber manufacturers anticipate a brisk demand for small-size casings, however, as soon as Ford Motor Co. gets into production.

Tire prices continue on a stable basis, and are expected to remain so for some time. Most rubber manufacturers do not look for much of a change in the crude rubber market in the near future.

Increased demand for the new "Commander" tire is reported by the B. F. Goodrich Co. This tire was recently put on the market to meet competition of other manufacturers.

$30,000,000 for Roads in Czecho-Slovakia

WASHINGTON, Sept. 14—The launching of its first highway building program has been announced by the Czecho-Slovakian government and reported to the Department of Commerce. The National Assembly has just passed a $30,000,000 appropriation for this purpose, to be expended over a period of 10 years. The law was enacted in connection with another statute providing for national taxes on motor vehicles. The revenues thus collected will go into the highway fund as will receipts from import duties on automobile tires.

Toledo Executives Form New Bearings Company

TOLEDO, Sept. 13—The Thompson-Owens Corp. capitalized at $50,000 was formed here this week to take over the plant of the former East Toledo Aluminum & Brass Castings Co. and convert it into a complete plant for manufacture of bronze bushings and bearings for the automotive and machine tool trades. Production is to start Oct. 1.

George Thompson, for 10 years factory manager of the Bunting Brass & Bronze Co., will be president of the new company, and John E. Owens, for 14 years in the sales department of the same company, will be secretary-treasurer. Clyde D. Eno will be vice-president. The three officers with Frank C. Fisher were incorporators.

Offer $10,000,000 in Bonds of Firestone, California

NEW YORK, Sept. 12—A syndicate headed by the Cleveland Trust Co., Otis & Co. and the National City Co. offered today $10,000,000 of Firestone Tire & Rubber Co. of California, 15-year sinking fund 5 per cent bonds, due Sept. 1, 1942, at 96½ and interest, to yield over 5.33 per cent.

The bonds will be unconditionally guaranteed as to principal, interest and sinking fund by the Firestone Tire & Rubber Co. of Ohio, which will own the entire issue of common stock of the Firestone of California.

H. F. Firestone Heads Subsidiary

LOS ANGELES, Sept 13—Harvey S. Firestone, president of the Firestone Tire & Rubber Co., heads the new California subsidiary as president, it is formally announced. Russell A. Firestone, who handled most of the negotiations for the entrance of the Firestone organization in California, is vice-president. Other officers are E. A. Oberlin, Jr., treasurer and L. T. Lyle, secretary.

Truck Makers Urged to Stop Bad Deals

Finance Companies to Act on Restoring Standing of Paper, Says Hanch

DETROIT, Sept. 13—At the annual meeting of the National Association of Finance Companies, Nov. 15, it is expected that definite steps will be taken to rehabilitate the standing of truck paper, C. C. Hanch, general manager of the National Association of Finance Companies, told members of Motor Truck Industries, Inc., here today.

Mr. Hanch urged manufacturers to follow the example of passenger car producers in eliminating many hazardous deals by tightening credit restrictions, both in the matter of requiring more substantial down payments and by extending time payments over a shorter period than has been practiced in the past.

Figures now available on 1927 show that appreciable gains are being made in reducing the amount of instalment paper for transactions involving less than standard down payments. He expressed the opinion that paper, substandard as to down payments, would not involve more than 5 per cent of total volume compared with 9 per cent in 1926 and 19 per cent in 1925. The instalment paper business in the passenger car field is in much better shape than in the past 30 months, he said.

The truck association devoted much time to discussing the advisability of member companies arranging to interchange credit information and officers of the association will investigate the question and report at the next meeting. They will also consider the advisability of engaging a competent secretary to carry on this work.

Accomplishments in bettering trade conditions made by the Chicago & Illinois Truck Association were described by S. M. Williams, president, and led the association to urge establishment of similar organizations in other cities. The association will finance expenses of necessary speakers at organization meetings in various cities.

The Autocar Co. and Standard Motor Truck Co. were added to the membership.

S.A.E. Hears Bennett

SAN FRANCISCO, Sept. 10—The Northern California Section of the Society of Automotive Engineers, heard a highly interesting address on fusion welding by James C. Bennett, at its regular monthly meeting and dinner in the Hotel Whitcomb. Mr. Bennett is manager of the automotive department of the Associated Oil Co., past chairman of the San Francisco Section of the American Welding Society, and member of the California state advisory committee on welded pressure vessels.

Automotive Parts Jobbers Form Los Angeles Club

LOS ANGELES, Sept. 13—An organization has recently been formed here composed of some 30 of the leading automotive parts jobbers of this district under the banner of the "Automotive Parts Club of Southern California."

The officers of the club are president, R. W. Foote, of Kanouse & Foote; vice-president, H. J. Banta, of the Banta Co.; secretary-treasurer, C. C. Colyear, president Colyear Motor Sales Co.; executive secretary, Sol Smith. Directors are: Jack Dalton, J. H. Dielmann Co., Inc.; L. N. Dietrich, of L. N. Dietrich; Hugh G. Gibson, of Gibson Motor Parts Co.; Harry S. Harlow, of Hockaday & Harlow; George R. Myers, of the Automotive Sales Co.

S. A. E. Sections in Frolic

MILWAUKEE, Sept. 15—The Chicago Section of the Society of Automotive Engineers was the guest of the Milwaukee section at a summer frolic at the Westmoor Country Club, Milwaukee, this week. Originally the Milwaukee members planned the event as a curtain-raiser to the resumption of fall and winter meetings, and the plan was enlarged upon to embrace the members of the Chicago group, out of which the local section was formed.

Coming Feature Issues of Chilton Class Journal Publications

Sept. 20—Bus Show Issue—Commercial Car Journal.

Oct. 1—Production and Factory Equipment Issue—Automotive Industries.

Nov. 10—Marketing Annual—Motor World Wholesale.

Williams Abandons Entry in Schneider Cup Race

NEW YORK, Sept. 10—Lack of time in which to make necessary changes in his new racing seaplane, powered with a Packard X engine, yesterday obliged Lieut. Alford J. Williams to abandon his plans to enter the plane in the Schneider cup races at Venice.

Lieutenant Williams was hampered all during August by bad flying weather and in his recent flights he discovered that the pontoons, no matter how adjusted, exerted a downward pull in the seaplane at high speeds. There is not sufficient time to change the pontoons so that he has decided to install ground landing gear and go after the speed record held by Bonnet of France.

Natural Gas Fuel Used in Cincinnati Vehicle

CINCINNATI, Sept. 16—Natural gas instead of gasoline is being used in a 24 hp. truck owned by the Union Gas & Electric Co. here, at a gas cost of ¾ cents per mile against 2 cents if gasoline were used. Substitution of a steel tank and an air mixer for gasoline tank and carburetor constitute the departure from conventional design. The tank is constructed to withstand a pressure of 200 lb. per square inch and has a capacity of 33 cu. ft. Tank pressure is reduced to about 4½ oz. by two regulator valves. Speed ranges from 3 to 40 m.p.h.

Tests show that 10 cu. ft. of gas at low pressure will operate the truck one mile, which at a cost of 75 cents for 1000 cu. ft. of natural gas, is ¾ cents per mile. If manufactured gas is used the cost would be twice as much because it contains only about one-half as many heat units. The principal disadvantage is the large size of the tank.

Erskine Santa Fe Winner

SOUTH BEND, Sept. 16—The Studebaker Corp. of America has been notified by its Buenos Aires branch of the winning of the Santa Fe Automobile Club race from Santa Fe, Argentina, to Buenos Aires, by an Erskine sedan. The distance was 345 miles and the run was made in nine hours and 48 minutes at an average speed of 35.2 m.p.h.

Calendar of Coming Events

SHOWS

American Electric Railway Association, Public Auditorium, Cleveland..Oct. 1-7
American Road Builders Association, Public Auditorium, Cleveland..Jan. 9-13
Argentine .....Nov. 10-20
Automotive Accessories Association, Armory, Chicago .....Nov. 7-12
Automotive Equipment Association, Coliseum, Chicago .....Nov. 7-12
Boston, Aviation and Radio Exposition .....Sept. 26-Oct. 1
*Chicago, National Automobile Chamber of Commerce, Coliseum Jan. 28-Feb. 4
Electrical and Industrial Show, Grand Central Palace, New York....Oct. 12-22
Glasgow .....Nov. 4-12
International Aircraft Show, Berlin March 23-April 11
Lille, France, Exposition..Nov. 20-Dec. 4
London Passenger Car Show ....Oct. 14-22
London Truck Show .....Nov. 17-26
Machine Tool Exposition, National Machine Tool Builders' Association, Public Auditorium, Cleveland Sept. 19-23
Montevidio .....Nov. 19-27
National Air Races, Spokane, Wash. Sept. 23-24
National Standard Parts Association, Convention Hall, Cleveland..Nov. 14-18
National Steel and Machine Tool Exposition. American Society for Steel Treating, Convention Hall, Detroit, Sept. 19-23
*New York, National Automobile Chamber of Commerce, Grand Central Palace .....Jan. 7-14
Paris, Grand Palais .....Oct. 6-16
Rio de Janeiro .....May 3-13
Salon, Automobile Salon, Inc., Hotel Drake, Chicago .....Jan. 28-Feb. 4
Salon, Automobile Salon, Inc., Hotel Biltmore, Los Angeles .....Feb. 11-18
Salon, Automobile Salon, Inc., Hotel Commodore, New York..Nov. 27-Dec. 3
Salon, Automobile Salon, Inc., Hotel St. Francis, San Francisco Feb. 25-March 3
United States Good Roads Show, Des Moines .....May 28-June 1

*** Will have special shop equipment exhibit.**

CONVENTIONS

American Electric Railway Association, Public Auditorium, Cleveland..Oct. 3-7
American Gear Manufacturers Association, Mt. Royal Hotel, Montreal Oct. 20-22
American Institute of Mining & Metallurgical Engineering, Metals Division, Book-Cadillac Hotel, Detroit .....Sept. 19-23
American Management Association, cooperating with Society of Automotive Engineers in Production Meeting .....Sept. 19-22
American Road Builders' Assn., Hotel Hollenden, Cleveland .....Jan. 9-13
American Road Builders' Association, Banquet, Hollenden Hotel, Cleveland .....Jan. 11
American Society of Mechanical Engineers, First National Fuels Meeting, St. Louis .....Oct. 10-13
American Society for Steel Treating, Convention Hall, Detroit ..Sept. 19-23
American Welding Society, Book-Cadillac Hotel, Detroit .....Sept. 19-23
Associated Manufacturers of Fabric Auto Equipment, La Salle Hotel, Chicago .....Nov. 5
Automotive Equipment Association, Coliseum, Chicago .....Nov. 7-12
Aviation Conference, Hotel Statler, Boston .....Sept. 30
Machine Tool Congress, Cleveland Sept. 19-22
National Association of Finance Companies, Congress Hotel, Chicago Nov. 14-15
National Battery Manufacturers Ass'n, Hotel Niagara, Niagara Falls Sept. 29-30
National Foreign Trade Council, Houston, Texas .....April 25-27
National Hardware Association, Marlborough-Blenheim, Atlantic City Oct. 17-20
National Machine Tool Builders Association, Congress, Winton and Cleveland Hotels, Cleveland Sept. 19-22
National Research Council, Washington, D. C. .....Dec. 1-2
National Safety Council, Stevens Hotel, Chicago .....Sept. 26-30
National Standard Parts Association, Hotel Hollenden, Cleveland..Nov. 14-18
National Tire Dealers' Association, Brown Hotel, Louisville, Ky..Nov. 15-17
Overseas Automotive Club, Inc., Monthly Luncheon, Hotel Astor, New York .....Oct. 13
Overseas Automotive Club, Inc., Overseas Visitors' Dinner, Stevens Hotel, Chicago .....Nov. 9
Overseas Automotive Club, Inc., Monthly Luncheon, Hotel Astor, New York .....Dec. 8
United States Good Roads Association and Bankhead National Highway Association, Des Moines..May 28-June 1
World Motor Transport Congress, London .....Nov. 14-17

N. A. D. A.

Chicago, Jan. 31-Feb. 2—Annual, Palmer House.
Chicago, Feb. 1—Banquet, Palmer House.
New York, Jan. 9-10—Eastern District, Hotel Commodore.

S. A. E.

National

Aberdeen Proving Ground, Oct. 6—Joint meeting with Army Ordnance Association.
Chicago, October 25-27—National Transportation and Service Meeting.
Chicago, Dec. 1—Tractor Meeting.
Cleveland and Detroit, Sept. 19-22—Production Meeting.
Detroit, Jan. 24-27—Annual Meeting.
New York Sessions, October 18-20—Aeronautic Meeting.
New York, Jan. 12—Annual Dinner.
Spokane Session, Sept. 23—Aeronautic Meeting.

Sectional

Milwaukee, Oct. 5—First Meeting.

RACES

British Grand Prix, Brooklands....Oct. 1
Charlotte, N. C. .....Sept. 19